

**WETLAND INVENTORY UPDATE  
YEAR 7 SYNTHESIS REPORT  
2011**



May 2012  
Water Resources Division  
Lummi Natural Resources Department  
Lummi Indian Business Council

**LUMMI NATION**

**WETLAND INVENTORY UPDATE**  
**YEAR 7 SYNTHESIS REPORT**  
**2011**

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## 1. INTRODUCTION

The Lummi Indian Reservation (Reservation, see Figure 1) is located along the western boundary of Whatcom County, Washington and includes the mouth of the Nooksack and Lummi rivers. Both the Nooksack and Lummi River Watersheds are under environmental pressures from rapid regional growth. The Lummi Nation has also entered a period of rapid economic development under self-governance. Growth on and near the Reservation requires that the Nation's core environmental program prioritize the development of a regulatory infrastructure that is technically sound, legally defensible, and administratively efficient and allows for growth while protecting tribal resources and the Reservation environment. This regulatory infrastructure supports both the tribal goal and the Environmental Protection Agency (EPA) policy of tribal self governance and recognition of sovereignty.

Previous EPA and other funding sources have supported the Lummi Nation's assessment of priority water resource needs and the identification of unmet needs. Environmental planning intended to protect the Nation's water resources has included development of a Storm Water Management Program (Lummi Water Resource Division [LWRD] 1998a, LWRD 2011b), a Wellhead Protection Program (LWRD 1997, LWRD 1998b, LWRD 2011c), a Wetland Management Program (LWRD 2000), a Non-Point Source Management Program (LWRD 2001, LWRD 2002), and Water Quality Standards for Surface Waters of the Lummi Indian Reservation (LWRD 2008). These programs are components of a comprehensive water resources management program (CWRMP) being developed and implemented pursuant to Lummi Indian Business Council (LIBC) resolutions No. 90-88 and No. 92-43.

In January 2004, the Lummi Nation Water Resources Protection Code (Title 17 of the Lummi Code of Laws [LCL]) was adopted. Based on a Reservation-wide wetland inventory completed in 1999 (Harper 1999) and as described in Chapter 17.06 (Stream and Wetland Management) of LCL Title 17, different types of wetlands that vary in their quality and importance occur on the Reservation. In order to establish appropriate levels of protection, pursuant to LCL Chapter 17.06 the Reservation wetlands must be classified into one of four categories. Lummi Administrative Regulation (LAR) 17 LAR 06 identifies methodologies to evaluate Reservation wetlands.

Category 1 wetlands are considered critical value wetlands that have a high and irreplaceable level of importance for fisheries, Lummi culture, and/or water quality on the Reservation. Category 2 wetlands are difficult to replace, but not impossible. They provide high levels of some functions and still need a high level of protection. Category 3 wetlands provide a moderate level of functions and are often less diverse. Category 4 wetlands have minimum habitat value and are suitable for restoration or enhancement efforts.

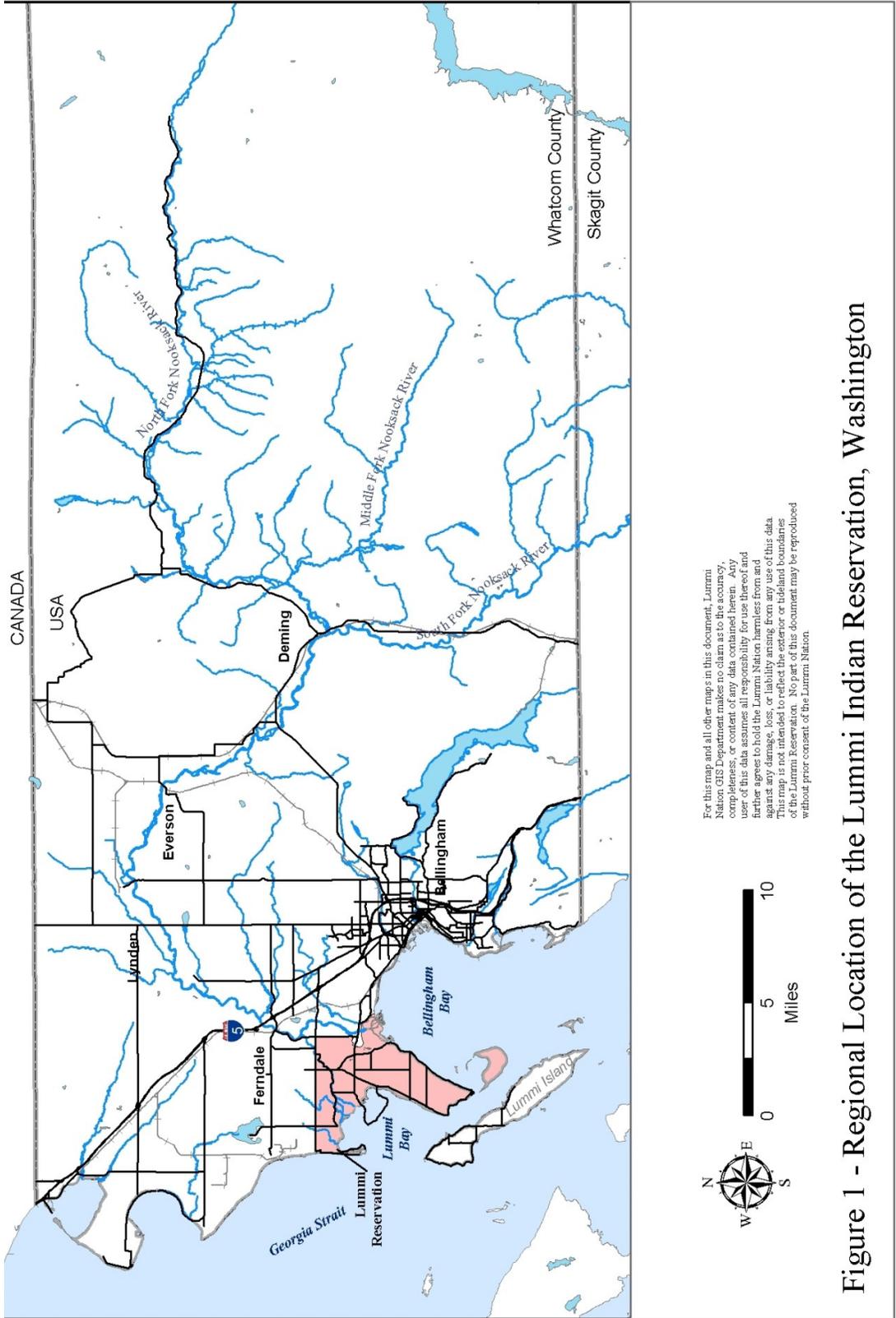


Figure 1 - Regional Location of the Lummi Indian Reservation, Washington

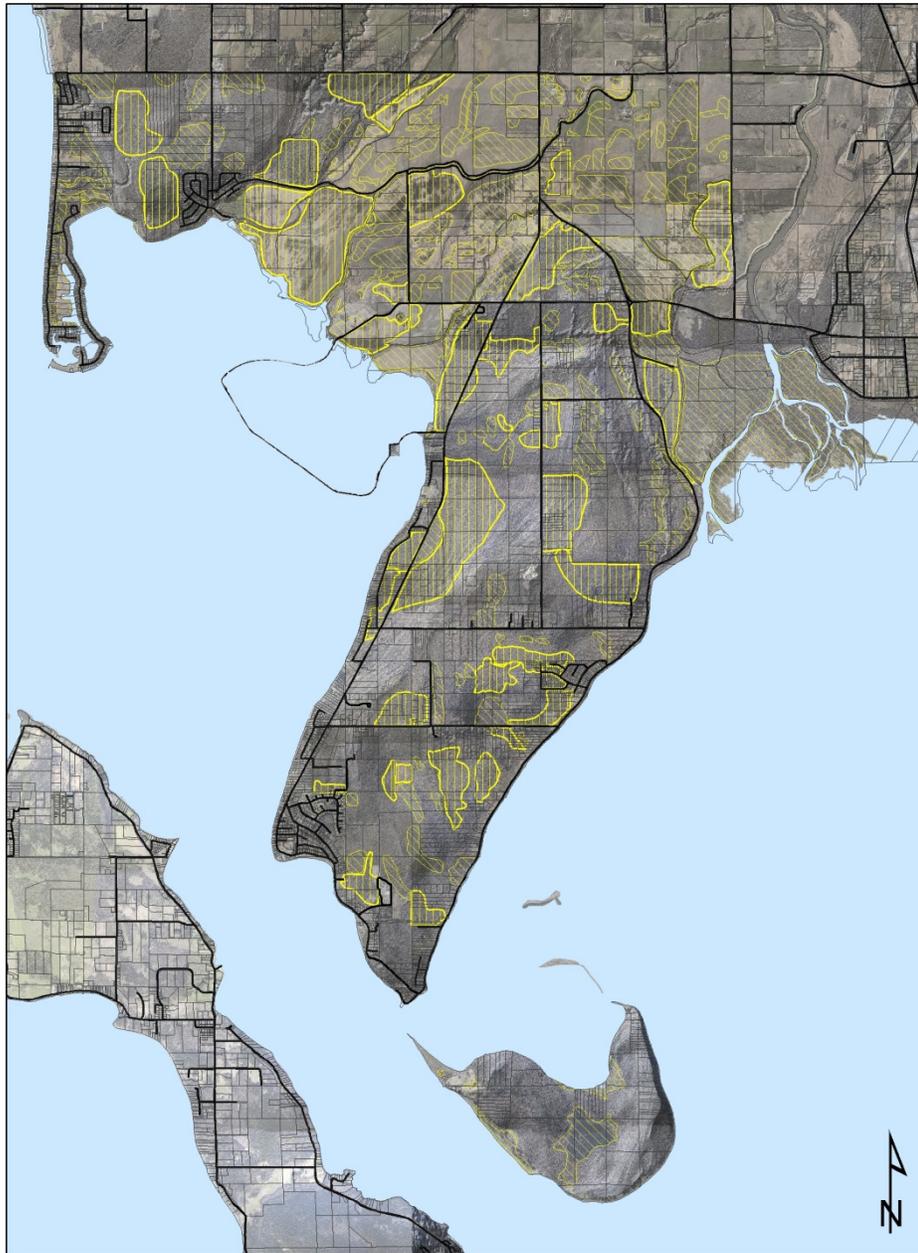
The purpose of the 1999 Reservation-wide wetland inventory was to identify wetland locations and to collect information on the characteristics and functions of the Reservation wetlands. The 1999 Reservation-wide wetland inventory (Harper 1999) relied largely on remotely sensed data (i.e., color and infra-red aerial photographs), generalized mapping (i.e., USDA soil survey), and limited field verification to identify wetland locations and sizes. In addition to identification and mapping, the 1999 inventory collected general wetland information including Cowardin classification (Cowardin et al. 1979), water source, and soil type. The Washington State Function Assessment Method (WFAM) was applied to 12 assessment units (AUs) in 9 selected wetlands on the Reservation. The 1999 inventory identified and mapped a total of 214 wetlands and wetland complexes on the Reservation (Figure 2). These wetland areas totaled 5,432 acres, or roughly 43 percent of the land area of the Reservation, excluding tidelands. Approximately 60 percent of these mapped wetland areas were located in the flood plains of the Lummi and Nooksack Rivers.

Although the 1999 inventory represents an important planning tool and a significant improvement over the previously available information, which was largely from the National Wetlands Inventory (NWI) (USFWS 1987), the 1999 inventory has proven to be too general for many planning efforts. The 1999 inventory either did not map some wetlands or generally shows larger wetland areas than are surveyed in the field or identified using Global Positioning System (GPS) technology.

The inventory update effort is focused on refining the spatial resolution of wetland mapping, performing function assessments, and classifying the wetlands into the regulatory categories identified in Title 17. The wetland inventory update is intended to support efforts to protect these wetland resources and the important ecological, hydrological, and water quality protection functions they provide. Because of the large number of wetland areas on the Reservation, the effort to refine the spatial resolution of the wetland mapping, to perform function assessments, and to classify the Reservation wetlands was projected to require several years to complete.

Year 1 of the wetland inventory update effort was 2005. During the planning stages for this update effort, it was estimated that approximately 70 wetlands could be evaluated during one year (approximately three days per wetland). This estimate proved to be overly optimistic due to a number of factors including property access issues and the remoteness and size of some of the wetlands. There were also seasonal considerations including long periods of flooding, frozen ground, and snow that limited and/or prevented wetland boundary determination during portions of the winter season. During the summer season, mapping forested wetland areas is problematic because GPS satellite signals are often difficult to obtain through the dense tree canopy.

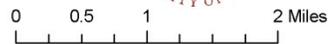
**Figure 2 - 1999 Wetland Inventory Results**



**Estimated Wetlands - 1999**

-  Wetland
-  Wetland Complex
-  Parcels

Lummi Nation makes no claim as to the accuracy, completeness, or content of any data contained herein. This map is not intended to reflect the extent of land boundaries of the Lummi Reservation. All warranties of fitness for a particular purpose and of merchantability are hereby disclaimed.



As described in more detail below, a wetland-consulting firm was contracted following Year 3 of the update effort to provide an independent program evaluation and quality assurance/quality control review. As a result of this evaluation and review, the functional assessment element of the wetland inventory update effort was deemphasized during Year 4. Since that time, functional assessments are deferred for wetlands until a development activity is imminent and the assessment is needed to determine appropriate mitigation measures for any unavoidable wetland impacts.

For the current inventory update, a wetland evaluation consists of conducting a site visit(s), performing a detailed reconnaissance-level delineation, using a mapping grade GPS unit to map the approximate location of the identified wetland boundaries, collecting representative data samples in wetland and upland locations, and classifying the wetlands into one of the four Lummi categories.

This report summarizes the results of Year 7 of this inventory update effort. The results from Year 1 through Year 6 of the update effort are summarized in similar synthesis reports (LWRD 2005, LWRD 2006, LWRD 2007, LWRD 2009, LWRD 2010, LWRD 2011a). In total, 50 wetlands are identified as part of this Year 7 effort (approximately 23-percent of the total number of wetlands identified during the 1999 inventory). When combined with the 167 wetlands identified during Year 1 through Year 6 of the inventory update, a total of 217 wetlands have been evaluated as part of the inventory update effort. This total is more than the 214 wetlands identified on the Reservation during the 1999 inventory. However, as described in more detail below, although a number of the wetlands included in the inventory update were not originally included in the 1999 inventory, some of the wetland areas identified as part of the inventory update project were just portions of larger wetland areas identified during 1999. Consequently, the total number of evaluated wetlands does not provide a full picture of the update progress. To date, the area covered in the inventory update is slightly less than 50- percent of the Reservation land.

Based on this experience and assuming the same evaluation methodology and rate, additional time will be required to complete the evaluation of all of the Reservation wetlands.

## **2.0 METHODS FOR WETLAND INVENTORY UPDATE**

The methods used to update and refine the spatial resolution of the 1999 inventory are described below. Lummi Water Resources staff and a consulting firm (Northwest Ecological Services, LLC [NES]) hired by the Lummi Planning Department, the Lummi Housing Authority, the Lummi Tribal Sewer and Water District, or the Lummi Natural Resources Department, collected and interpreted the field data summarized in this Year 7 wetland inventory update report.

Three interrelated methods were used to update and refine the 1999 inventory. The different methods were used for wetland mapping/boundary determination, wetland rating/classification, and updating the Lummi Nation GIS wetland inventory/database.

## **2.1 Method for Wetland Mapping/Boundary Determination**

Properties evaluated during the current inventory year were chosen based on development applications and/or potential for development. Because of property access issues and the remoteness and size of some of the Reservation wetlands, it is not practical to undertake a geography-based approach (i.e., watershed by watershed) to selecting the wetlands evaluated during this study. Instead, the wetlands evaluated during this inventory update were based on areas with a high probability of development, areas being considered for purchase, areas where field conditions were appropriate for obtaining an accurate wetland boundary for the season, parcels for which Lummi Land Use Permit Applications were submitted to the Lummi Planning Department, and/or parcels where a development project has recently or is currently occurring.

In several cases, the inventory update was completed only within the confines of a single parcel or portion of a parcel. Many of these parcels were identified in the 1999 inventory as containing large wetlands or wetland complexes located over multiple contiguous parcels. Because acquiring landowner permission is time consuming, particularly for undivided parcels in trust status that may have in excess of 100 landowners, in many cases only a portion of the wetland was mapped. As a result, there are several wetlands and numerous fragments of wetlands that have been mapped by Lummi Water Resources Division staff during the last several years. Whenever possible, staff attempts to identify the wetland boundary to the limits of the parcel boundaries. These partial wetland areas are mapped and appear in Figure 3 and Figure 4. Completion of the updated wetland boundaries and classification/ratings has not yet been performed due to time constraints, adverse weather, and/or other reasons. These areas have been archived in the Lummi Nation Geographic Information System (GIS) so that work can continue on these wetlands and mapping, function assessments, and categorization can be finalized in the future as this wetland inventory update is completed.

Once a wetland from the 1999 inventory or a land parcel was selected for evaluation, the methodology used to reliably identify and map the wetland boundaries was as follows:

1. Prior to conducting a field visit, available remotely sensed data including high resolution aerial photography collected during 2004, 2008, and 2010 (approximately 0.5 feet resolution) and high-resolution (approximately  $\pm 0.5$  feet accuracy) topographic information acquired in 2005 using Light Detection and Ranging (LiDAR) technology are reviewed. Maps developed as part of the USDA soil survey for the area (USDA 1992) are also reviewed.

2. Information developed during the 1999 wetland inventory (if available), including watershed name and size, wetland size, Cowardin classes present, association Lummi Water Resources Division Wetland Inventory Update Year 7 (2011) Synthesis Report with streams or other water resources, and USDA soil units in the vicinity are reviewed.
3. During the field visit(s), one of the following two methods for determining wetland boundaries is used:
  - If development activities were planned that would potentially impact wetlands, or a jurisdictional determination of the wetland boundary was required, the wetland boundary was determined in the field using the criteria and methodology of the Wetland Delineation Manual (Manual) issued by the U.S. Army Corps of Engineers (COE 1987) and/or the criteria and methodology in the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (COE 2010). The manuals require examination of three parameters: vegetation, soils, and hydrology. This methodology requires evidence of at least one positive wetland indicator for each of the three parameters (vegetation, soils, and hydrology) to make a positive wetland determination. The specified criteria are mandatory and must all be present under normal environmental conditions. This method was used for wetlands that are adjacent to and associated with a development permit. These wetlands were typically delineated and surveyed by a professional surveyor, and computer aided design (CAD) data were provided to be incorporated into the Lummi GIS Database.
  - If development activities were not planned, a “reconnaissance-level” investigation is conducted to identify the approximate wetland boundary. Although the reconnaissance level investigation was conducted with reasonable accuracy, it is less exact than a boundary identification made during a more detailed “delineation” of the precise boundary. Much more time would be required if a formal delineation and jurisdictional determination were made on all the wetlands due to additional data that would need to be acquired. For the reconnaissance level determinations, the same criteria are applied but in a less formal and detailed manner. The wetland boundaries are identified within approximately +/- 10 feet and are recorded using a handheld Trimble GeoXT GPS unit, and downloaded into the ArcMap9 GIS software program. The horizontal accuracy of the Trimble GeoXT GPS unit is  $\pm 2$  feet once the collected data are post-processed. In some cases, only a portion of the wetland edge was recorded using a GPS unit, and the rest of the wetland boundary estimated using a combination of other methods (e.g., aerial photography and LiDAR). In other cases, portions of the wetland boundaries were recorded using a combination of an on-the-ground reconnaissance, GPS data, soil mapping, LiDAR data, and recent aerial photography.

## 2.2 Method for Wetland Rating/Classification

Pursuant to the Lummi Water Resources Protection Code (LCL Title 17) and 17 LAR 06.030, the Washington State Department of Ecology's *Wetland Rating System for Western Washington – Revised* (Hruby, 2004) was used to classify all wetlands inventoried for this Year 7 effort.

The wetland classification system was designed to differentiate between wetlands based on their sensitivity to disturbance, their significance, their rarity, the ability to replace them, and the functions they provide. The classification system results in rating wetlands into one of the following four categories:

- Category 1 wetlands are those that represent a unique or rare wetland type, or are more sensitive to disturbance than most wetlands, or are relatively undisturbed and contain ecological attributes that are impossible to replace within a human lifetime, or provide a high level of functions (scores > 70 points).
- Category 2 wetlands are difficult, though not impossible to replace, and provide high levels of some functions (scores between 51 – 69 points). These wetlands occur more commonly than Category 1 wetlands, but still need a relatively high level of protection.
- Category 3 wetlands provide a moderate level of functions (scores between 30 – 50 points). They have been disturbed in some ways, and are often less diverse or more isolated from other natural resources in the landscape than Category 2 wetlands.
- Category 4 wetlands have the lowest levels of functions (scores less than 30 points) and are often heavily disturbed. These are wetlands are most likely to be successfully replaced, and in most cases, improved. These wetlands may provide some important ecological functions, and also need to be protected.

The categories are intended to be the basis for wetland protection and management to reduce further loss of their value as a resource. Some decisions that can be made based on the rating include the width of buffers needed to protect the wetland from adjacent development, the mitigation ratios needed to compensate for impacts to the wetland, and permitted uses in the wetland. The wetland categorization or rating is the basis for determining the size of wetland buffers on the Reservation (LCL Title 17).

As a component of the rating process, a classification key was used to determine whether the wetland was riverine, depressionnal, slope, lake-fringe, tidal fringe, or tidal flats according to the hydrogeomorphic (HGM) classification system.

## 2.3 Method for Updating the Lummi Nation GIS Wetland Inventory/Database

As described in Section 2.1, the updated wetland boundaries were recorded by either a land survey or by using a mapping-grade Trimble GeoXT GPS unit. All information was entered into ArcMap10 GIS software. Once entered into the GIS, any newly identified

wetland areas were assigned an identification number corresponding to the update year. This numbering system is new in Year 7 and replaces the old number system that was started in 1999, and was based on the Public Land Survey System (Township, Range, and Section). This new numbering system is intended to avoid numbering problems inherent in the old system related to splitting, lumping, and adjusting boundaries previously identified in 1999. Other data that were entered into the GIS database for new wetlands included wetland area in acres and hectares, comments about location or other unique features of the wetland, wetland rating/classification, HGM classification, Cowardin classification, the date the wetland was mapped, and watershed name.

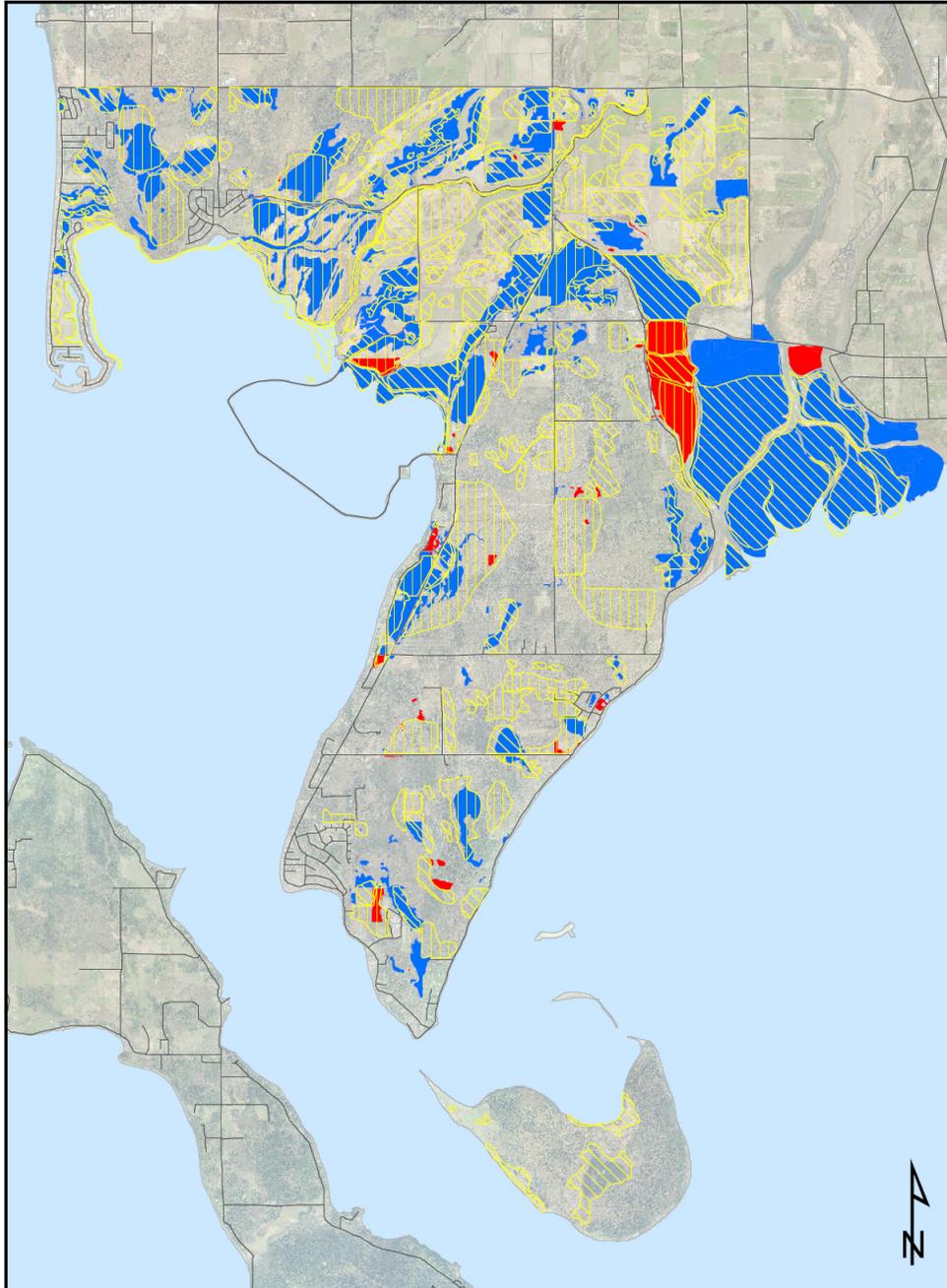
### **3.0 WETLAND INVENTORY UPDATE RESULTS**

The results from Year 7 of the wetland inventory update are summarized below. Detailed field forms for the wetland areas are maintained on file at the Lummi Water Resources Division office. An example of the documentation is included as Appendix B.

#### **3.1 Results of Wetland Mapping and Boundary Determination during 2011**

A total of 50 wetland areas were identified on the Lummi Reservation in the Year 7 wetland inventory update effort (Figure 3). This includes 20 wetlands that were field verified and mapped in 2011, and 30 wetlands that were mapped in previous years but were not included in previous reports. Detailed maps of each of these wetland areas are presented in Appendix A.

**Figure 3 - Updated Wetland Boundaries and Estimated Wetland Locations**



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As summarized in Table 1, a total of approximately 269 acres of wetlands were mapped as part of the Year 7 update. A comparison of the wetland acreage mapped during the first seven years of this update effort is also summarized in Table 1.

**Table 1. Comparison of Wetland Areas Evaluated by Program Year**

<b>Year</b>	<b>Number of Wetlands Evaluated</b>	<b>Evaluated Wetland Area (acres)</b>
1 (2005)	36	1,413
2 (2006)	41	581
3 (2007)	20	380
4 (2008)	14	20
5 (2009)	48	127
6 (2010)	8	203
7(2011)	50	269
<b>Total</b>	<b>217</b>	<b>2,993</b>

The annual variations in the reported acreage of mapped wetlands are due to a number of factors including:

- The Year 1 Report summarized work that occurred over a period of almost 3 years.
- The Year 2 Report summarized work that occurred over a 1-year period.
- The Year 3 Report summarized work that occurred over a 9-month period with a reduced work week as the Water Resources Planner II worked only 32 hours a week starting in June 2006.
- The Year 4 Report summarizes work that occurred over an 11-month period that included a Quality Assurance/Quality Control effort with ESA Adolfson, a re-verification of some wetland boundaries by Douglass Consulting, and the reorganization of the Lummi Natural Resources Water Resources Division. This reorganization eliminated the Water Resources Planner II position and created a Water Resources Planner I position. The staff transition included an investment in formal training and practical/field applications with various wetland scientists, which reduced the amount of time available to advance the wetland inventory update effort.
- The Year 5 Report summarizes work that occurred over a 1-year period including work completed in conjunction with wetland contractors hired by the Lummi Planning Department, Lummi Housing Authority, or the Lummi Tribal Sewer and Water District.
- The Year 6 Report summarizes work that occurred over a 1-year period including work completed in conjunction with wetland contractors hired by the Lummi Planning Department, Lummi Housing Authority, or the Lummi Tribal Sewer and Water District. Although fewer wetlands were evaluated during Year 6 compared to previous years, the acreage/area of the evaluated wetlands was greater than the wetland area evaluated during Year 4 and Year 5 combined.

- The Year 7 Report includes work that occurred over a period of several years. Thirty of the wetlands were updated in prior years but had not year been formally incorporated into the inventory update. Twenty of the wetlands were original work done by a combination of LIBC staff and wetland contractors hired by the Lummi Planning Department, Lummi Housing Authority, and/or Lummi Natural Resources Department.

Table 2 lists the 50 wetlands identified in the Year 7 wetland inventory update effort and their verified acreage. The identified wetlands are shown in Figure 3 and in higher resolution mapping included in Appendix A. The wetland acreage as determined during the Year 7 update, and the wetland acreage from the 1999 inventory results are also compared in Table 2. As summarized in Table 2, many of the wetlands were not included in the 1999 report, or the extent of the 2011 polygon is not similar enough to the 1999 polygon to compare acreage.

A total of 47 of the wetlands identified in the Year 7 report were not identified in the 1999 inventory, or the location or extent was not similar enough to the 1999 polygon to compare. When combined with the Year 1 through Year 6 wetland inventory update results (LWRD 2005, LWRD 2006, LWRD 2007, LWRD 2009, LWRD 2010, LWRD 2011), a total of 107 wetland areas totaling 242.34 acres have been identified that were not identified in the 1999 inventory. Because the size of the inventoried wetlands have been more accurately determined as part of the wetland inventory update project, in some cases the acreage has increased and in other cases the wetland acreage has decreased.

**Table 2 – Wetland Size Comparison Results**

Wetland ID Number	Watershed Identification	1999 Inventory Wetland Size (Acres)	Inventory Update Wetland Size (Acres)	Difference in Wetland Size (Acres)
2011-01	H	3.85	3.10	-0.75
2011-02	D	0 <sup>1</sup>	1.58	0
2011-03	D	0 <sup>2</sup>	0.29	0
2011-04	D	0 <sup>2</sup>	0.01	0
2011-05	D	0 <sup>2</sup>	0.03	0
2011-06	D	0 <sup>2</sup>	0.12	0
2011-07	G	0 <sup>1</sup>	2.54	0
2011-08	K	82.07	88.62	+6.55
2011-09	J	0 <sup>2</sup>	0.24	0
2011-10	J,S	79.19	80.15	+0.96
2011-11	K	0 <sup>1</sup>	0.86	0
2011-12	K	0 <sup>1</sup>	0.84	0
2011-13	K	0 <sup>1</sup>	0.45	0
2011-14	F	0 <sup>1</sup>	0.25	0
2011-15	F	0 <sup>1</sup>	0.03	0
2011-16	O	0 <sup>1</sup>	3.60	0
2011-17	K	0 <sup>1</sup>	18.07	0
2011-18	D	0 <sup>1</sup>	0.03	0
2011-19	D	0 <sup>1</sup>	0.02	0
2011-20	D	0 <sup>1</sup>	0.83	0
2011-21	O	0 <sup>2</sup>	0.47	0
2011-22	H	0 <sup>1</sup>	0.05	0
2011-23	D	0 <sup>1</sup>	0.50	0
2011-24	D	0 <sup>1</sup>	0.69	0
2011-25	D	0 <sup>1</sup>	5.12	0
2011-26	D	0 <sup>1</sup>	1.29	0
2011-27	F	0 <sup>2</sup>	2.08	0
2011-28	G	0 <sup>1</sup>	0.13	0
2011-29	S	0 <sup>1</sup>	28.32	0
2011-30	I	0 <sup>1</sup>	0.21	0
2011-31	S	0 <sup>1</sup>	1.20	0
2011-34	D	0 <sup>1</sup>	0.06	0
2011-35	Q	0 <sup>1</sup>	0.06	0
2011-36	K	0 <sup>2</sup>	0.04	0
2011-37	O	0 <sup>2</sup>	0.24	0
2011-38	P	0 <sup>1</sup>	0.03	0
2011-39	I	0 <sup>1</sup>	0.20	0
2011-40	I	0 <sup>2</sup>	0.34	0
2011-41	F	0 <sup>2</sup>	0.04	0
2011-42	F	0 <sup>2</sup>	0.06	0
2011-44	I	0 <sup>1</sup>	1.88	0
2011-45	K	0 <sup>2</sup>	2.39	0
2011-46	I	0 <sup>2</sup>	2.26	0
2011-47	I	0 <sup>2</sup>	0.15	0
2011-48	I	0 <sup>2</sup>	0.50	0
2011-49	C	0 <sup>2</sup>	10.89	0
2011-51	I	0 <sup>2</sup>	1.46	0
2011-52	I	0 <sup>1</sup>	5.39	0
2011-54	I	0 <sup>2</sup>	1.16	0
2011-55	S	0 <sup>1</sup>	0.06	0
<b>Total</b>		<b>165.11</b>	<b>268.93</b>	<b>+6.76</b>

Notes:

<sup>1</sup> Wetlands not identified in the 1999 Inventory.

<sup>2</sup> The location and/or extent of the 2011 wetland is not similar enough to the 1999 polygon to compare.

### 3.2 Results of Wetland Classification

Pursuant to 17 LAR 06.030, the Washington State Wetland Rating System for Western Washington (Hruby 2004) was applied to 25 of the wetland areas evaluated in 2011. No wetland rating or classification data is available for the additional 25 wetlands that were mapped in previous years but included in this report. Therefore, the additional wetlands were not included in Table 4. Table 4 presents a summary of the available wetland rating and classification for wetlands evaluated during Year 7.

**Table 4 – Wetland Rating and HGM Classification**

Wetland ID Number	Watershed Identification	Wetland Rating	HGM Class
2011-01	H	III	Depressional-outflow
2011-02	D	III	Depressional-closed
2011-03	D	III	Depressional-closed
2011-04	D	III	Depressional-closed
2011-05	D	III	Depressional-closed
2011-06	D	III	Depressional- closed
2011-07	G	III	Depressional-outflow
2011-08	K	I/II	Riverine, Depressional outflow/Depressional outflow
2011-09	J	IV	Slope
2011-10	J,S	III/I	Slope/ Depressional-outflow
2011-11	K	II	Depressional-outflow
2011-12	K	III	Depressional- outflow
2011-13	K	III	Depressional- outflow
2011-14	F	III	Depressional
2011-15	F	III	Depressional
2011-16	O	III	Depressional-outflow
2011-17	K	I	Estuarine
2011-18	D	III	Depressional
2011-19	D	IV	Depressional
2011-20	D	II	Depressional
2011-27	F	II	Depressional
2011-42	F	III	Depressional
2011-52	I	III	Depressional

Two of the wetlands (Wetlands 2011-08 and 2011-10) have more than one Category reported because they contain more than one unit. Of the wetlands evaluated during Year 7, three were rated as Category 1 wetlands (Wetlands 2011-08 and 2011-10 had more than one unit), three were rated as Category 2 wetlands (Wetland 2011-08 had more than one unit), 15 were rated as Category 3 wetlands, and two were rated as Category 4 wetlands.

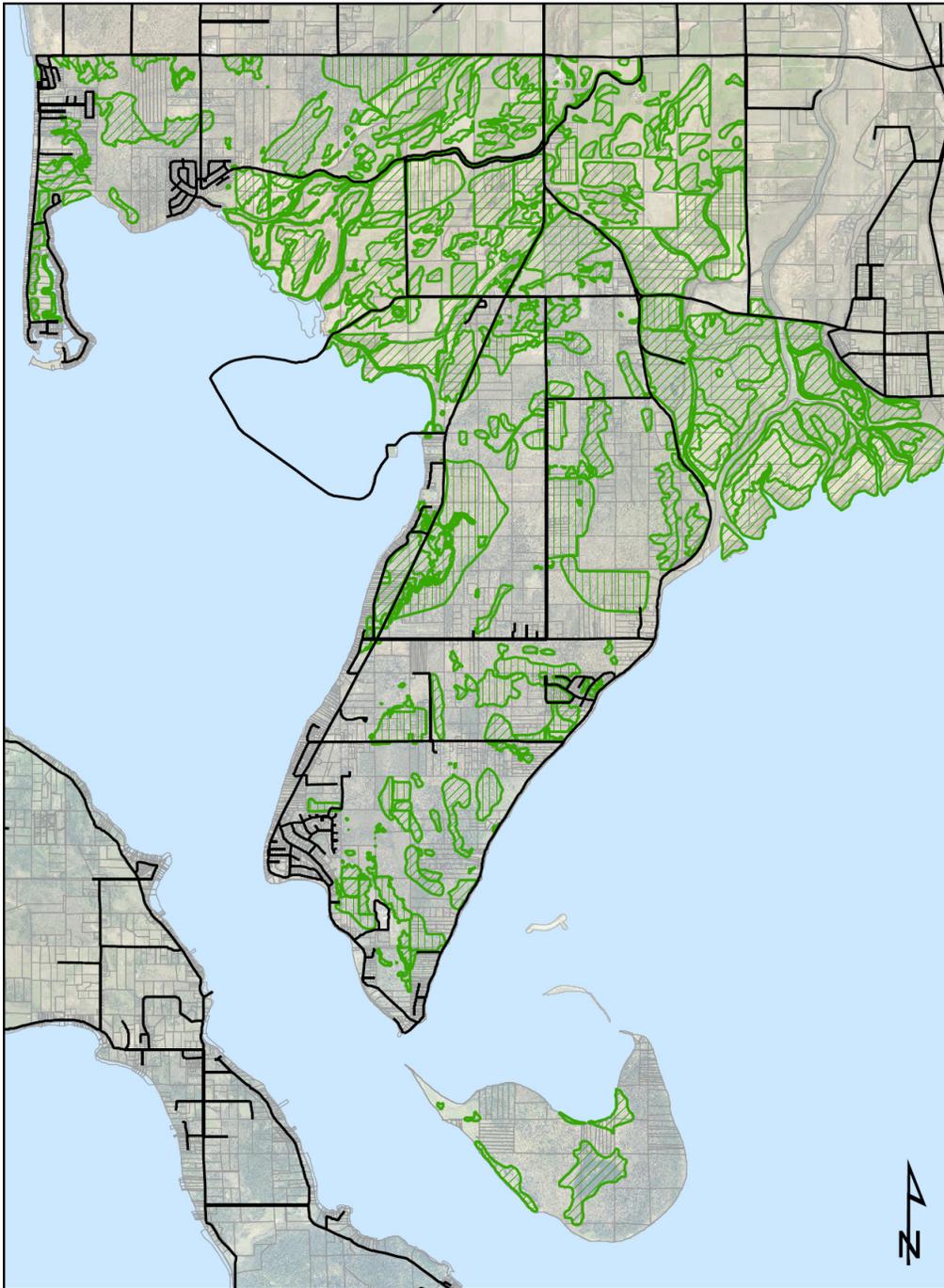
#### 4. SUMMARY

Accurate information on wetland locations, and areal extent, wetland category, and wetland functions is needed to effectively manage Reservation wetlands pursuant to the Lummi Nation Water Resources Protection Code (LCL Title 17) and associated Lummi Administrative Regulations. Although the 1999 inventory represents an important planning tool and a significant improvement over the previously available information, it has proven to be too general for many planning efforts. Refining the spatial resolution of the wetland mapping and classifying the wetlands into the regulatory categories identified in Title 17 is intended to support efforts to protect these wetland resources and the important ecological, hydrological, and water quality protection functions that they provide. Because of the large number of wetland areas on the Reservation, the effort to refine the spatial resolution of the wetland mapping and to classify the Reservation wetlands is projected to require several years to complete. This report summarizes the results of Year 7 of this inventory update effort.

The overall result of the inventory update effort will be a more accurate GIS data layer and an associated database that contains the Category and other summary information about each wetland on the Reservation. Hard copies of field notes (e.g., wetland rating worksheets, data, location maps) are maintained in binders in the Lummi Water Resources Division office. Until the update effort is completed, the GIS data layer and associated database will be a work in progress. The current version of the Lummi Reservation Wetland Map is shown in Figure 4. Figure 4 shows the information in Figure 3 except that the 1999 wetland locations were removed where more accurate information was available from the Year 1 through Year 7 inventory updates. Figure 4 is intended to reflect the best available information on Reservation wetlands to date. Based on the changes to the spatial locations and the utility of the collected information on wetland function and category, the inventory update is recommended to continue until it is completed.

As described previously, Year 7 of this inventory update resulted in revising the locations and extent of 20 wetland areas and classifying the wetlands into one of four categories, as well as reporting on an additional 30 wetlands that were mapped in previous years but were not included in previous reports. At the end of Year 7 of this update effort, a total of 217 wetland areas were evaluated, encompassing approximately 50-percent of the Reservation land. A total of 214 wetland areas were identified as part of the 1999 Reservation-wide inventory. However many of the wetlands reported in the Year 7 and previous reports were either not identified in the 1999 inventory or are portions of larger wetland areas identified during the 1999 inventory.

Figure 4 - Best Available Wetland Inventory Map (December 2011)



-  Wetland
-  Wetland Complex
-  Roads
-  Parcels

Lummi Nation makes no claim as to the accuracy, completeness, or content of any data contained herein. This map is not intended to reflect the extent of land boundaries of the Lummi Reservation. All warranties of fitness for a particular purpose and of merchantability are hereby disclaimed.



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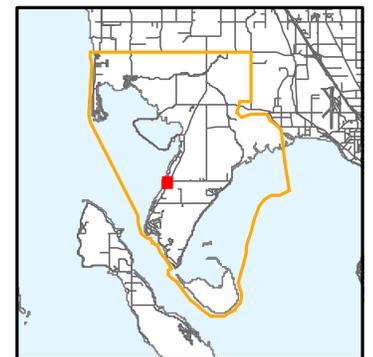
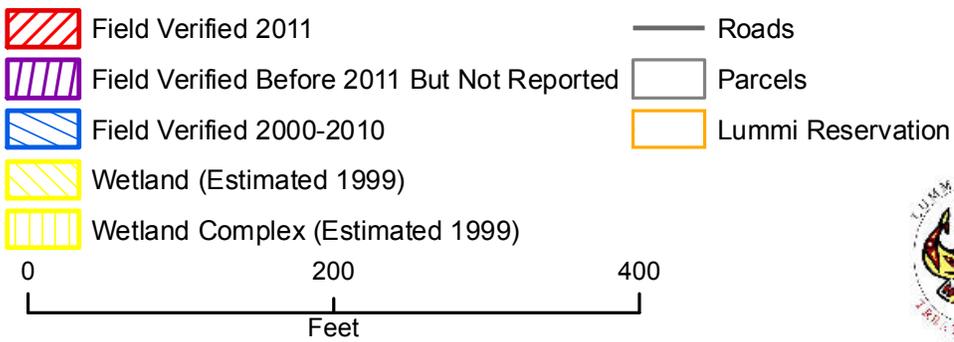
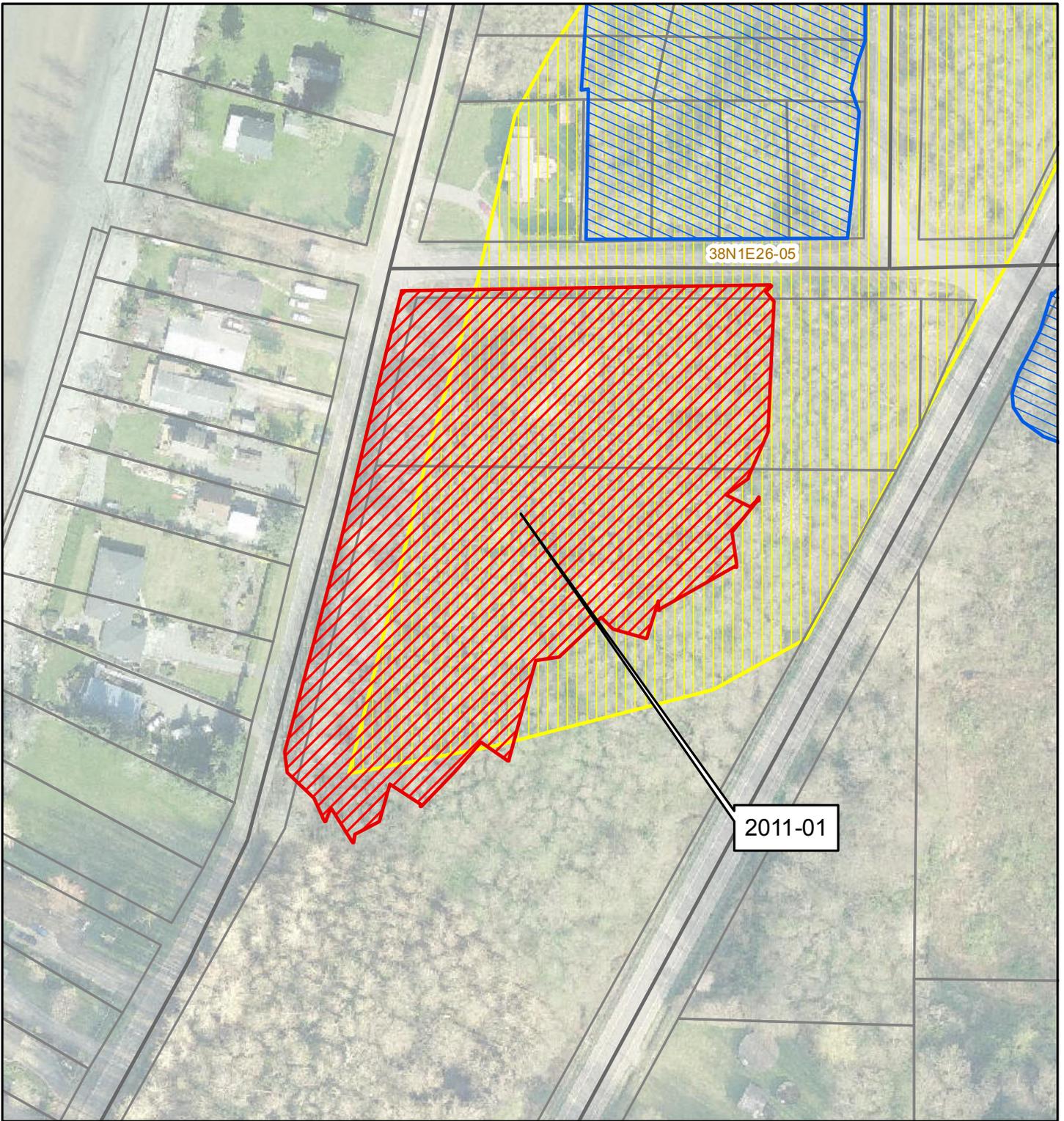
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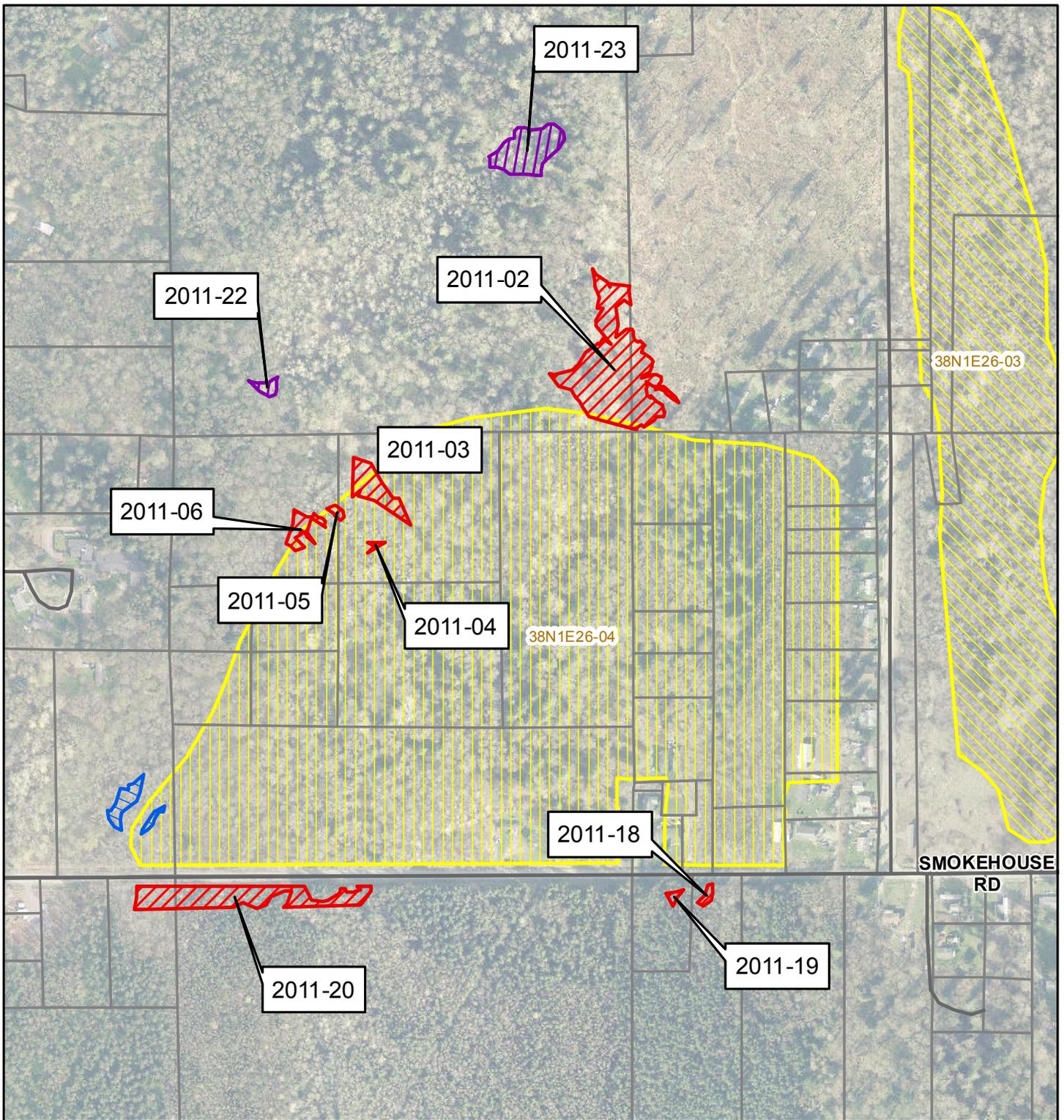
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## **APPENDIX A – INDIVIDUAL WETLAND MAPS**

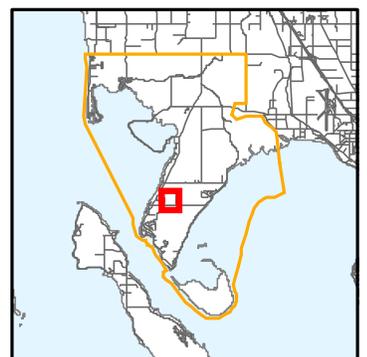
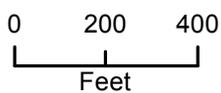
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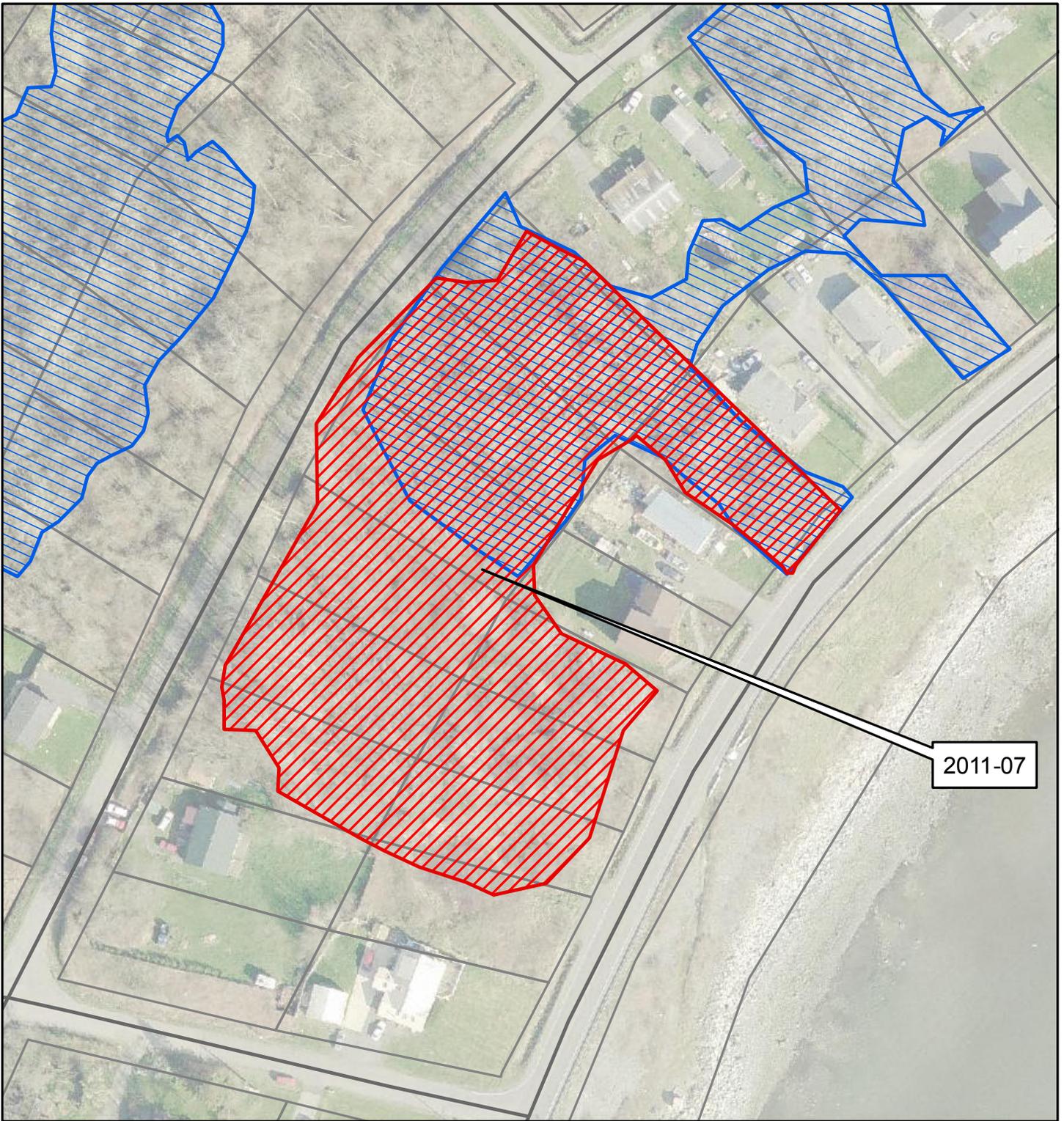
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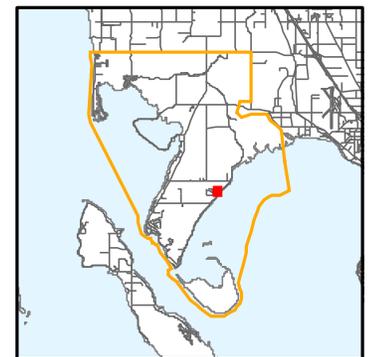
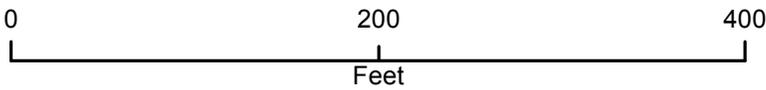
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-  Wetland Complex (Estimated 1999)
-  Roads
-  Parcels
-  Lummi Reservation



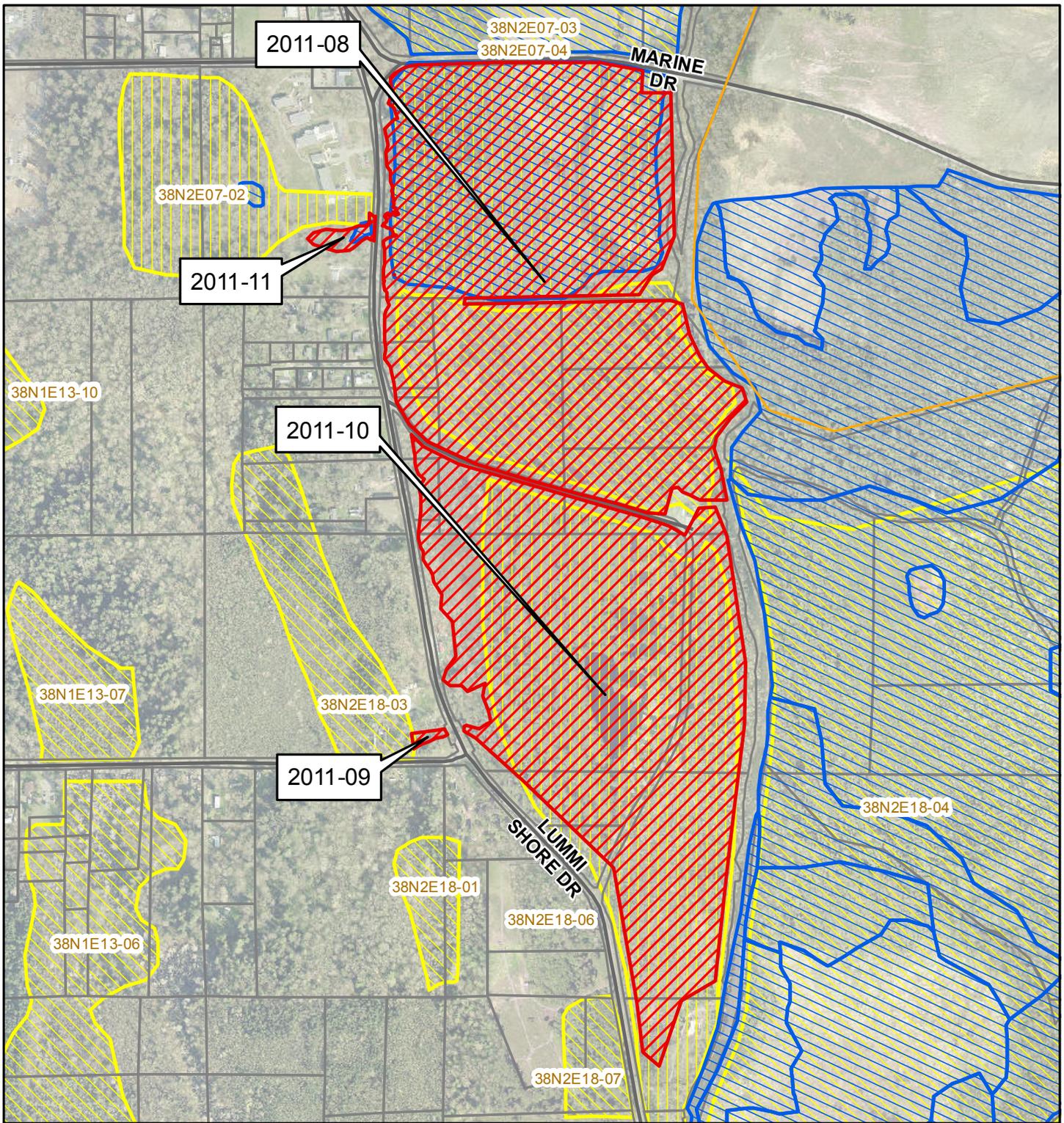
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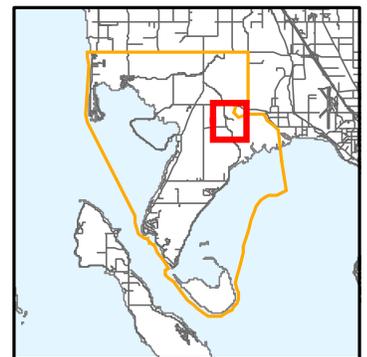
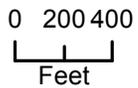
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-  Parcels
-  Lummi Reservation



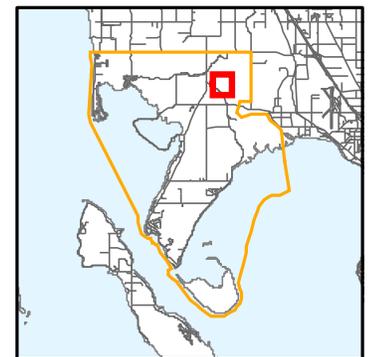
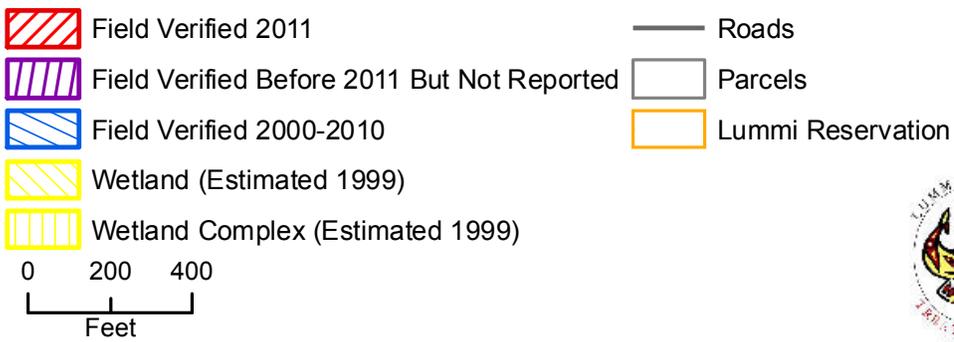
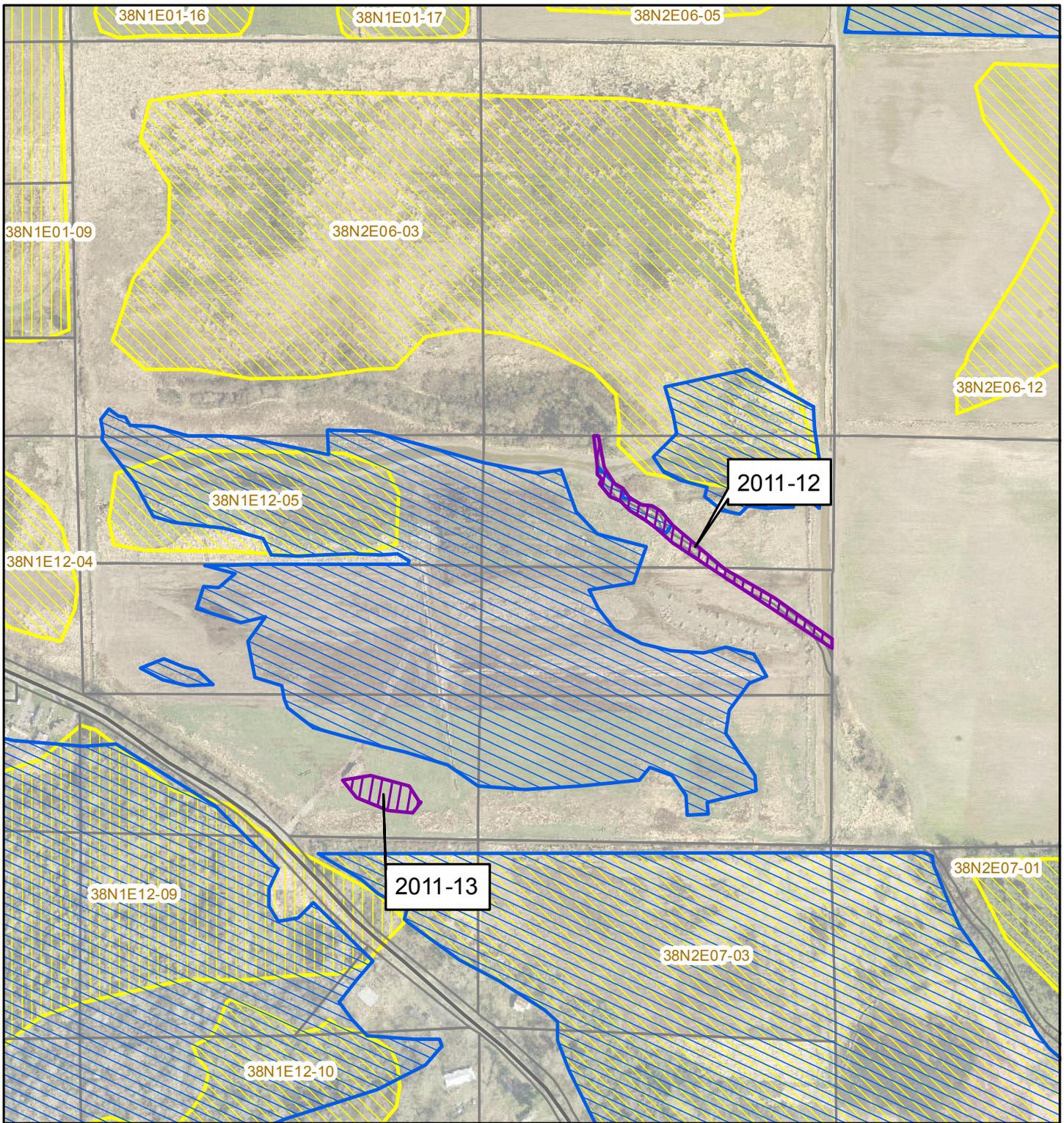
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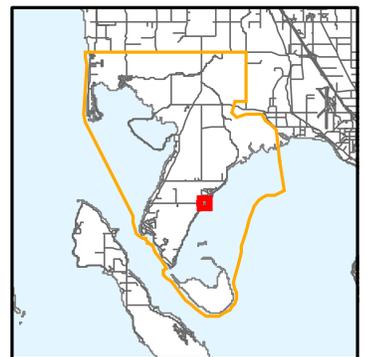
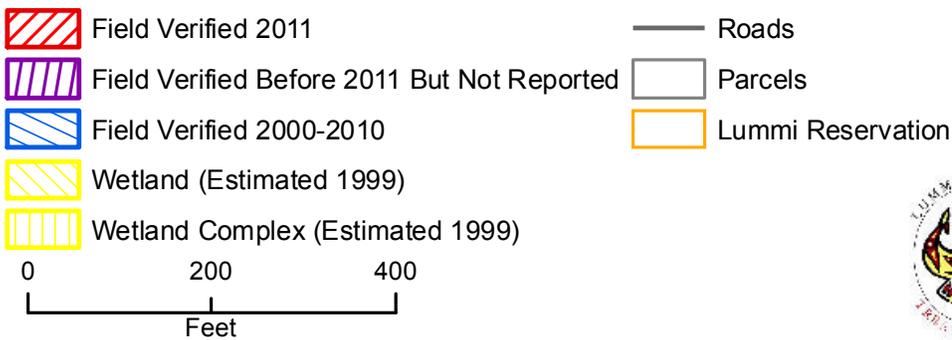
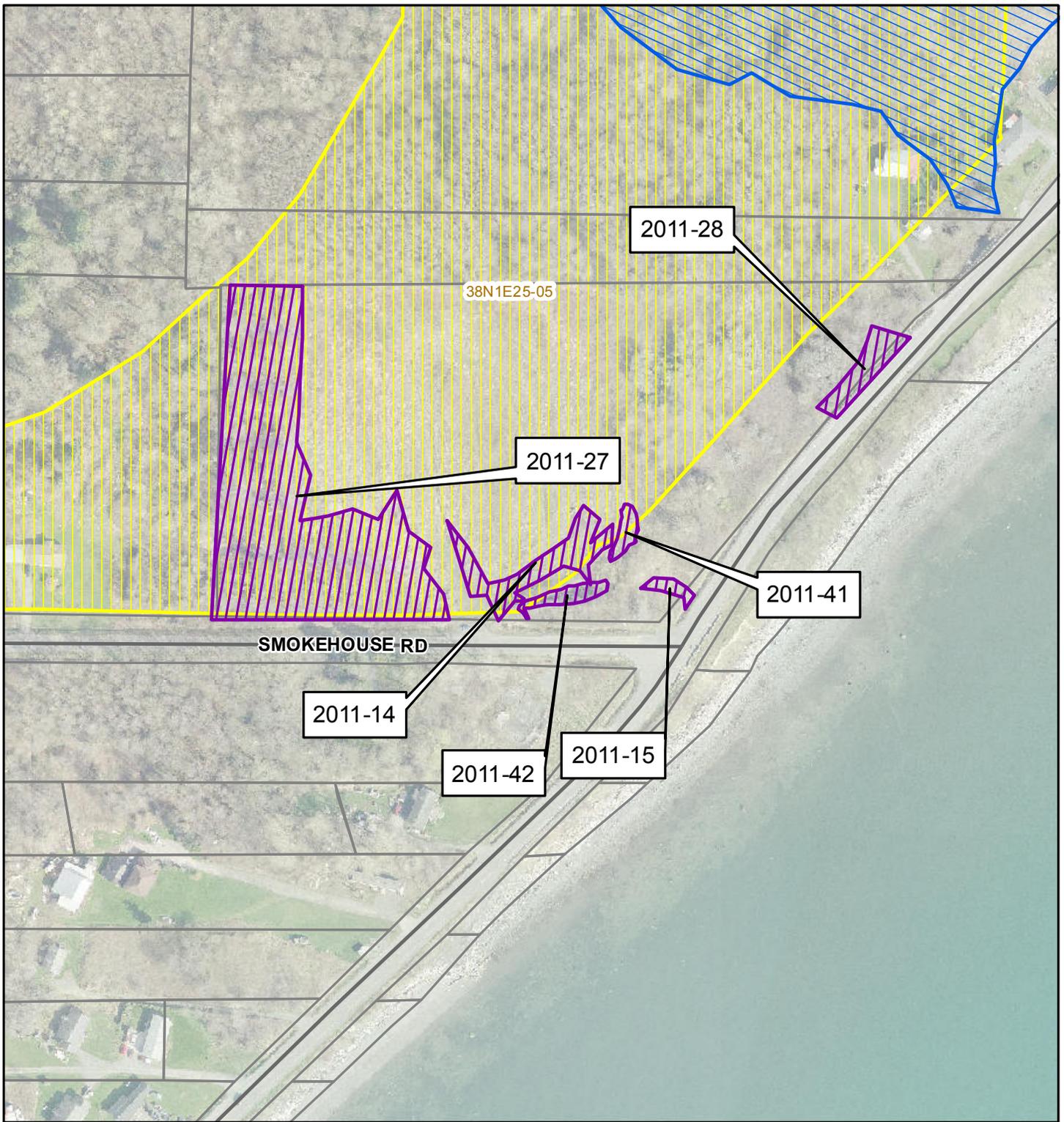
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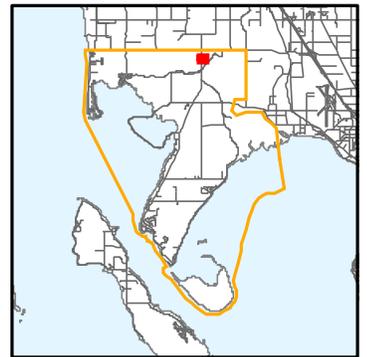
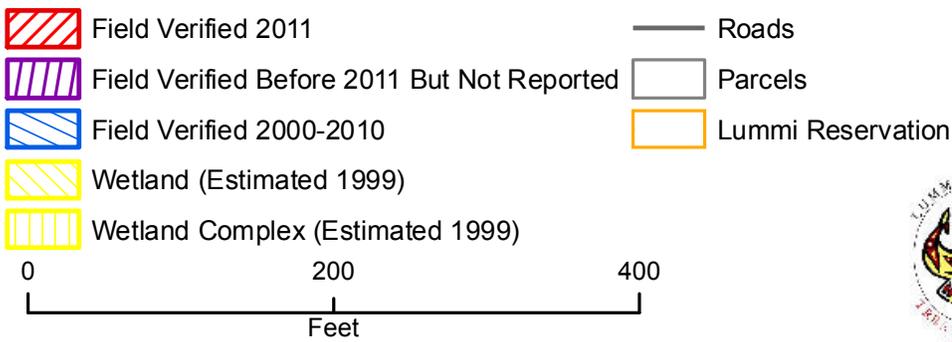
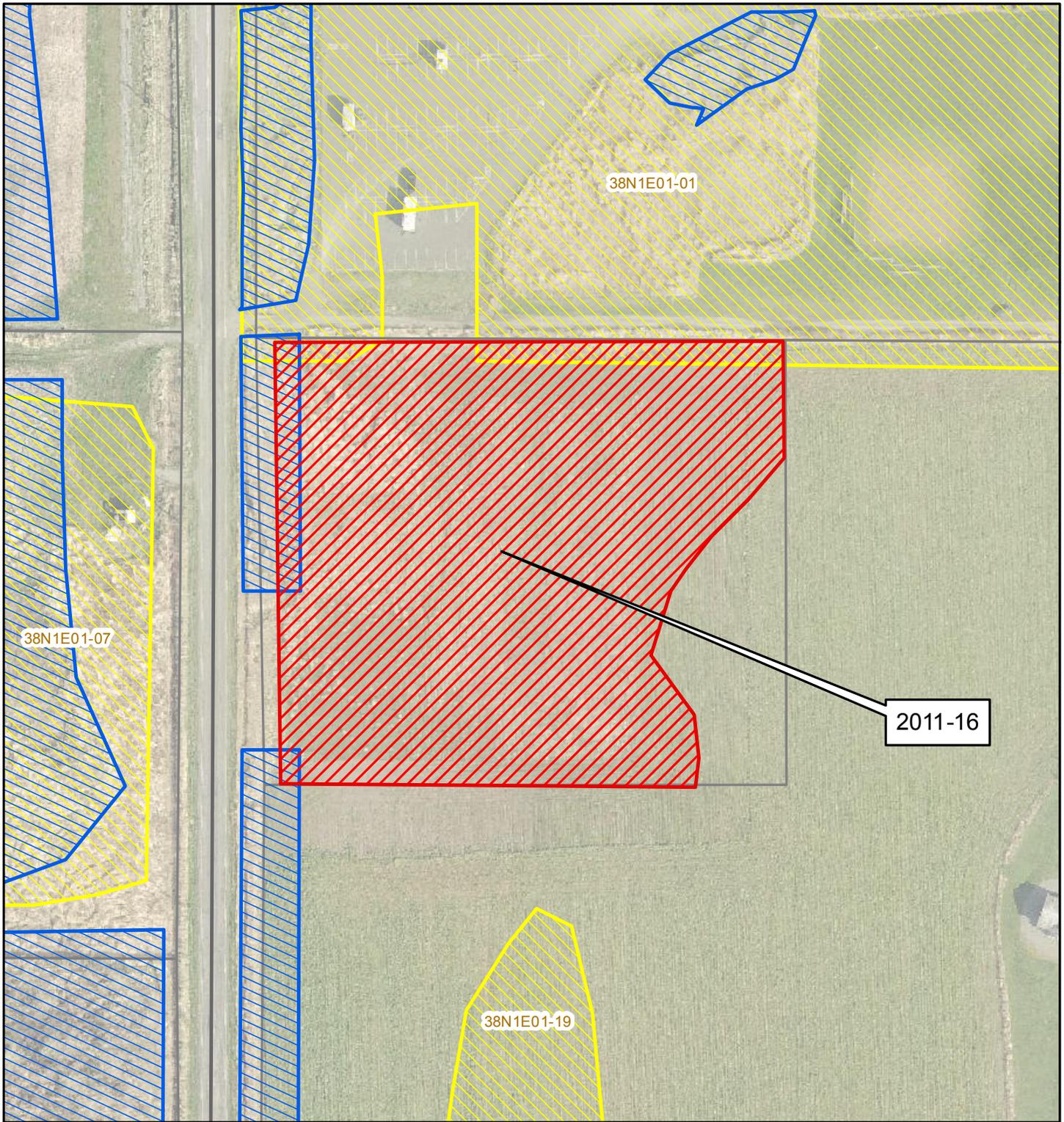
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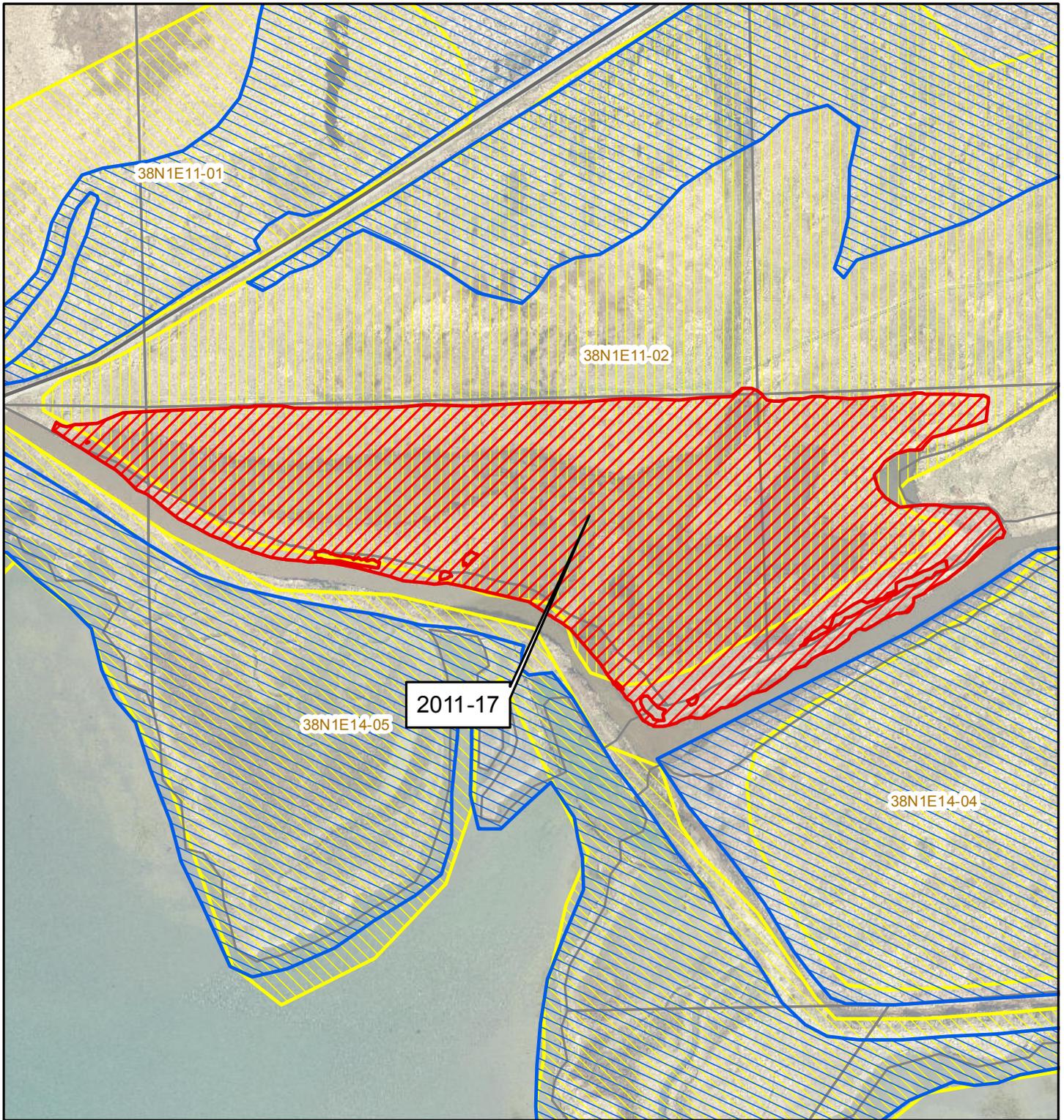
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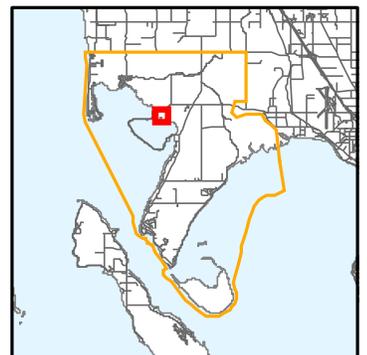
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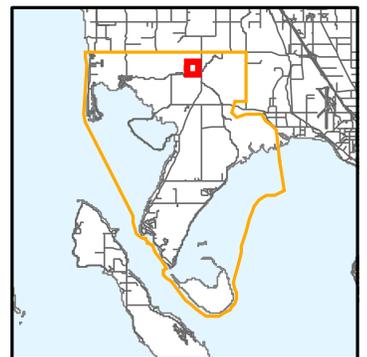
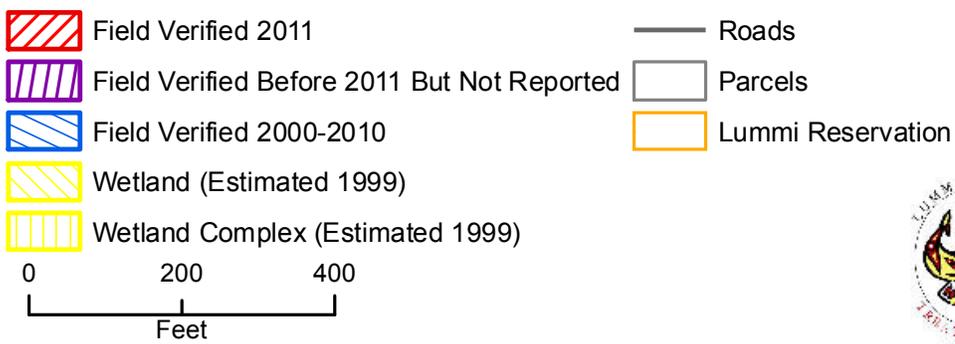
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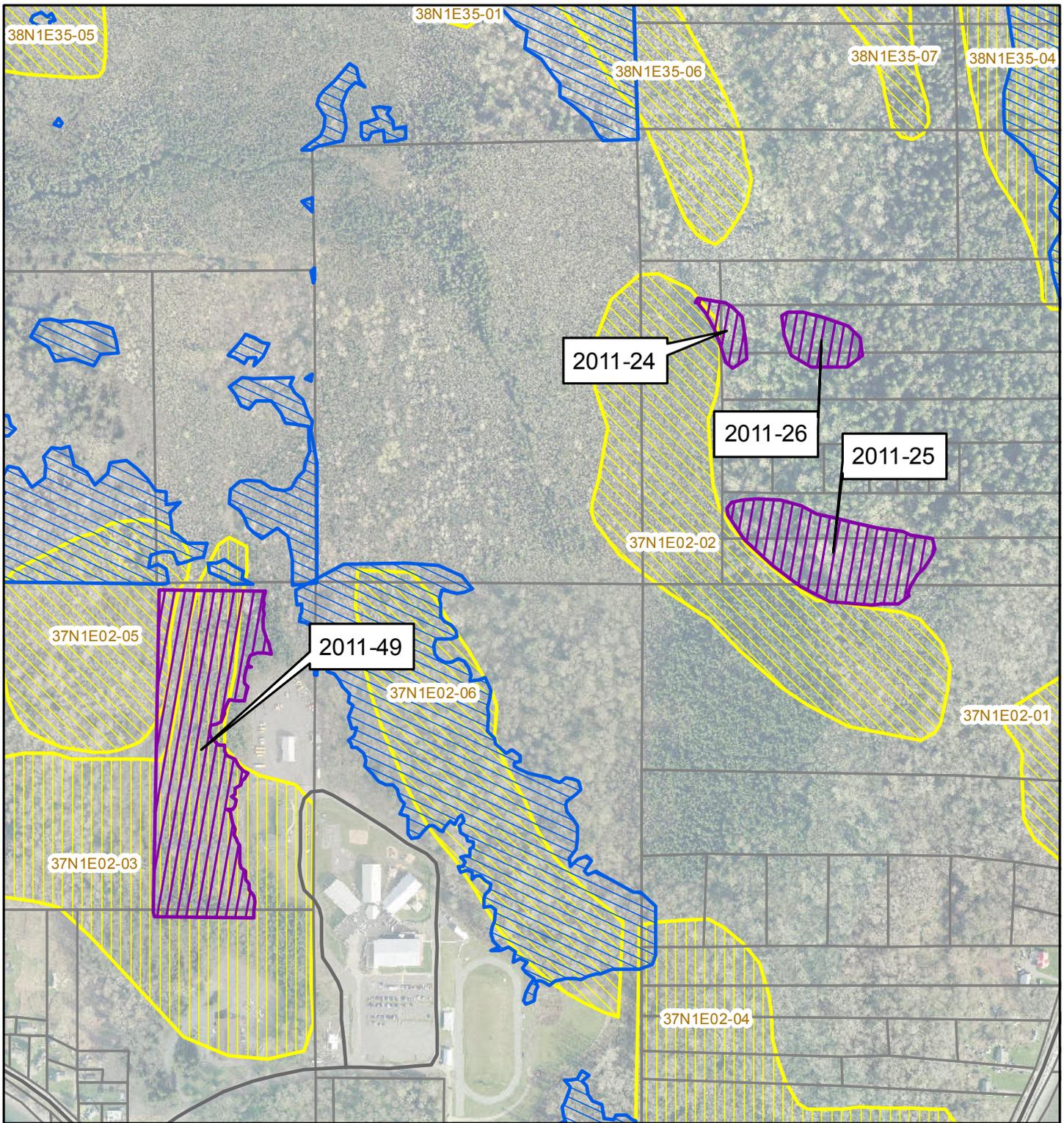
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  -  Lummi Reservation
- 0 200 400  
Feet



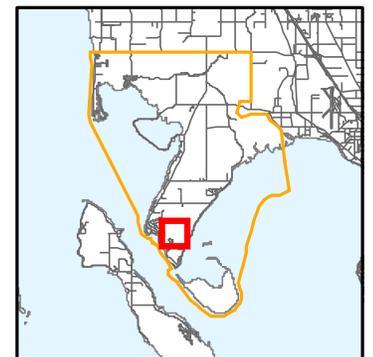
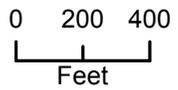
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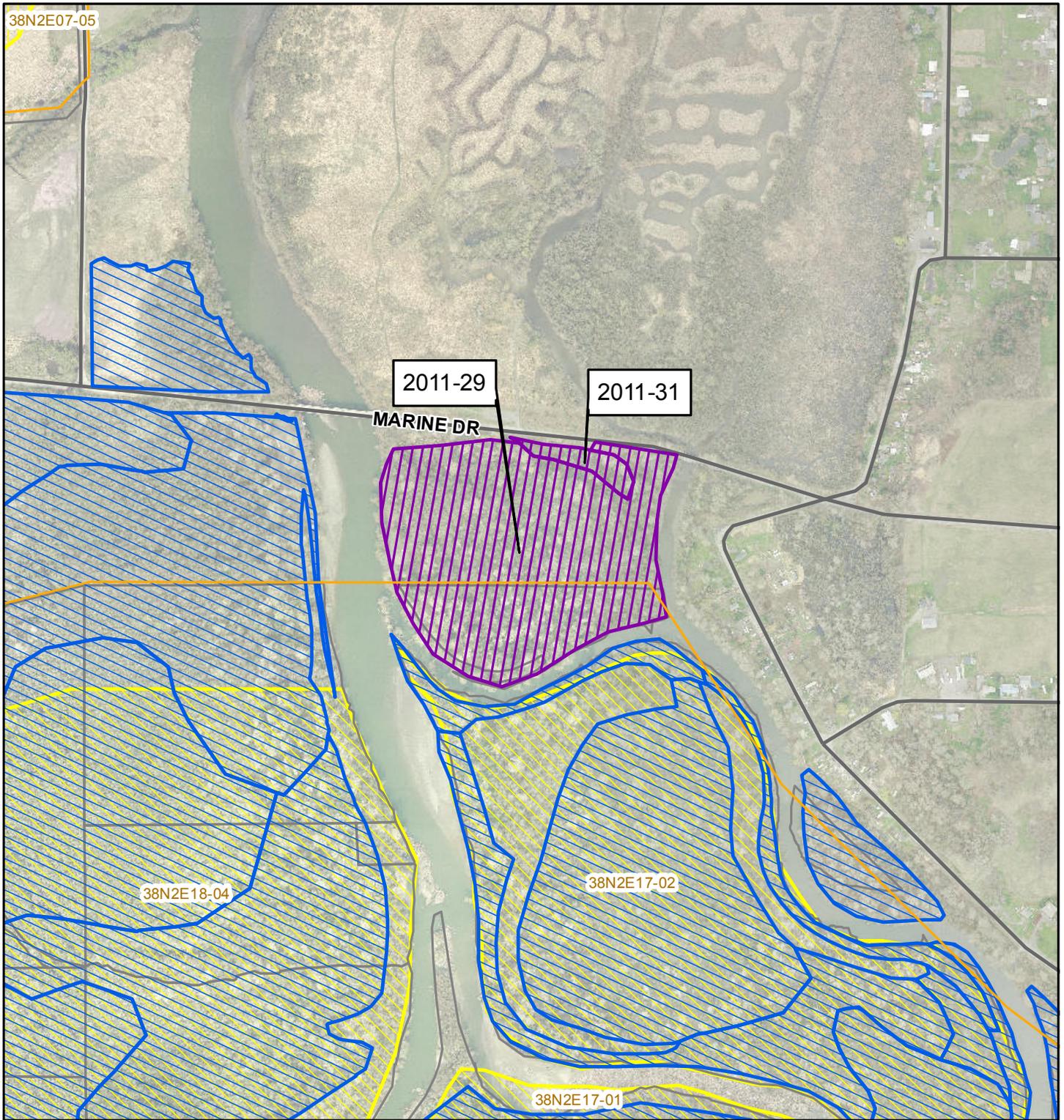
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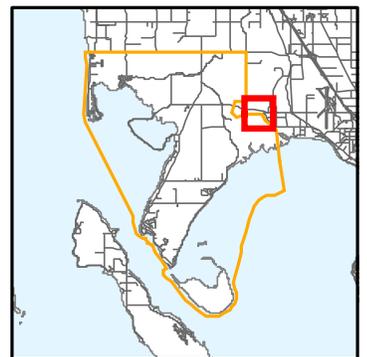
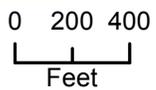
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-  Parcels
-  Lummi Reservation



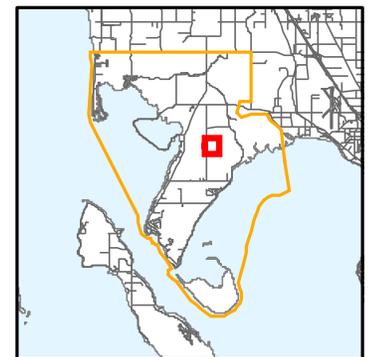
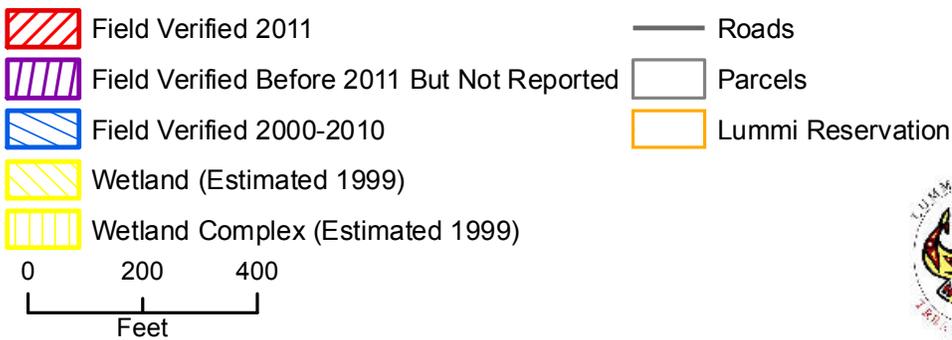
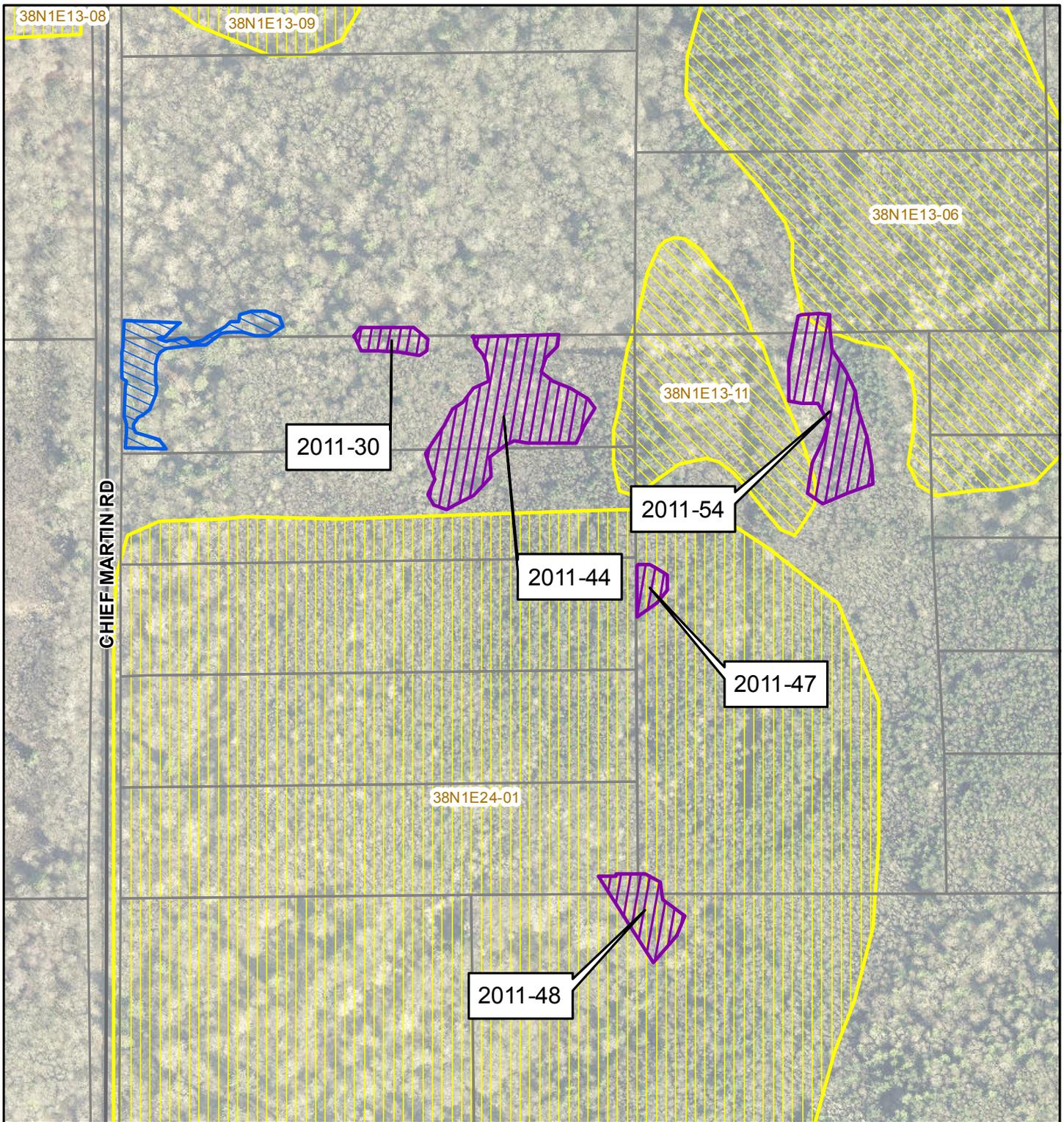
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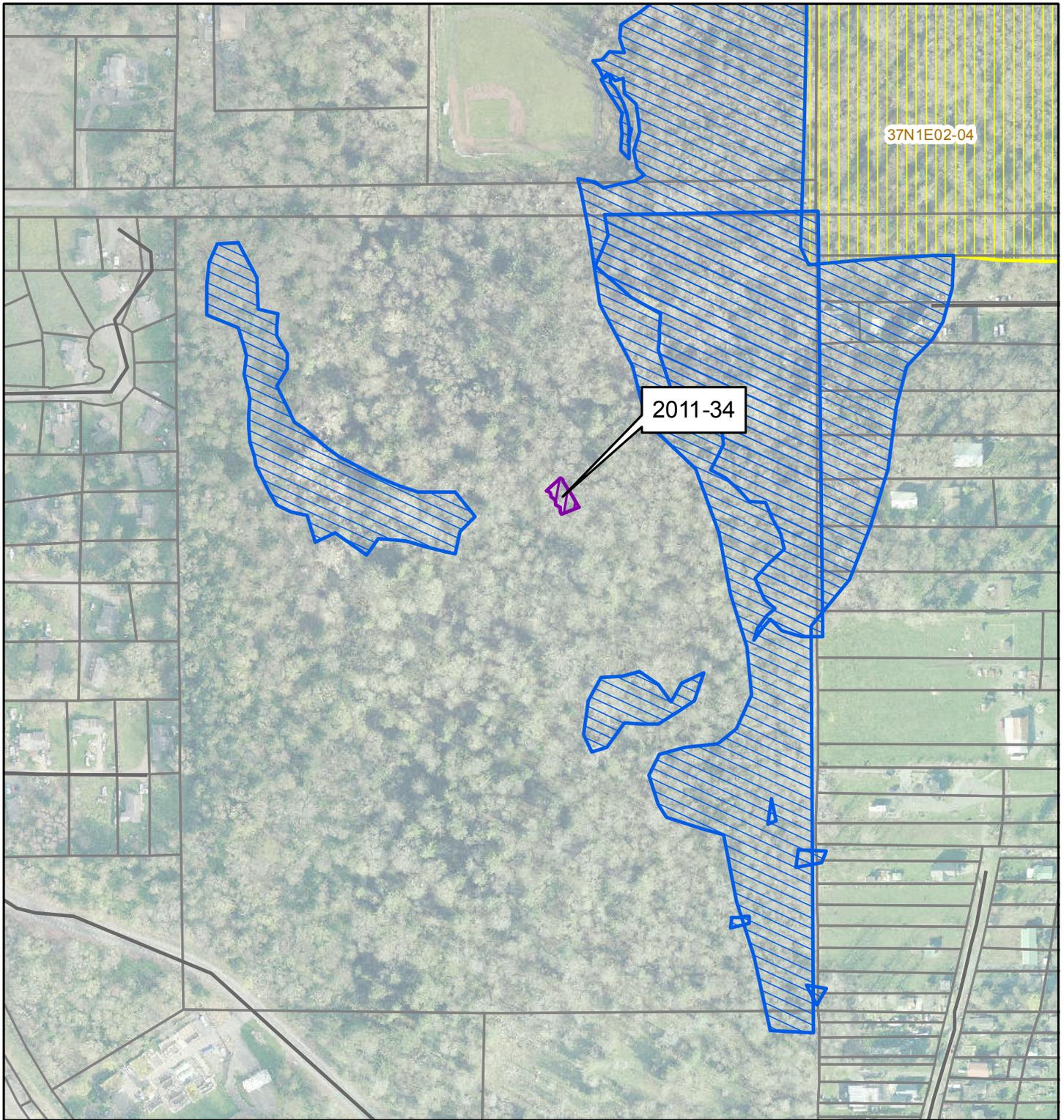
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-  Parcels
-  Lummi Reservation



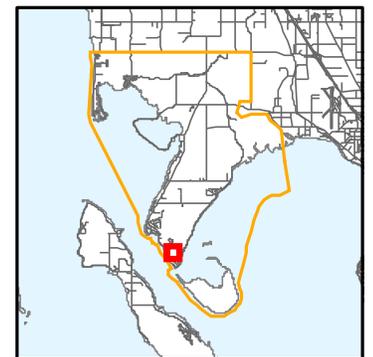
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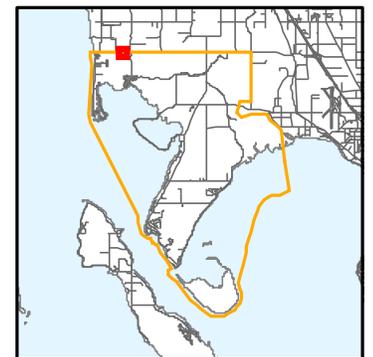
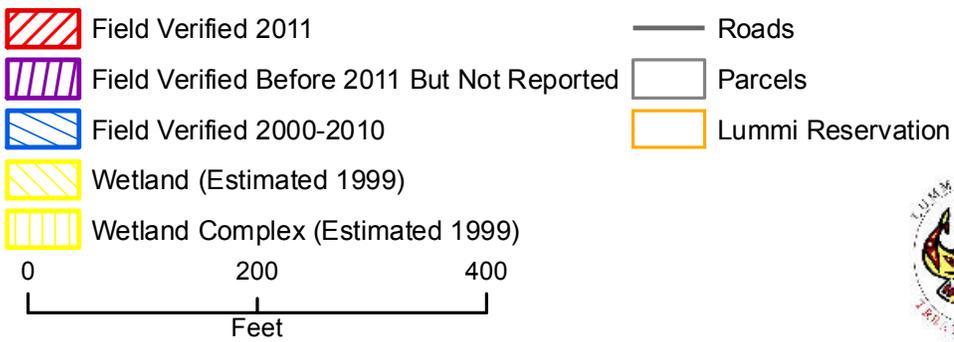
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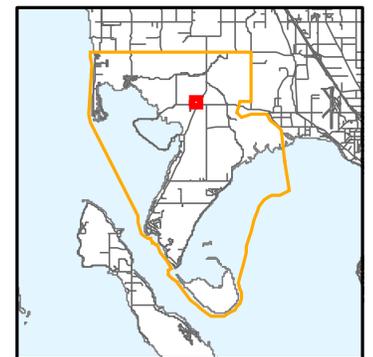
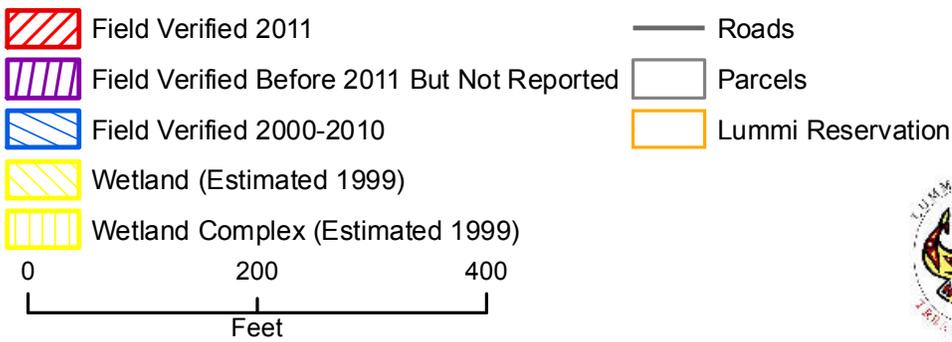
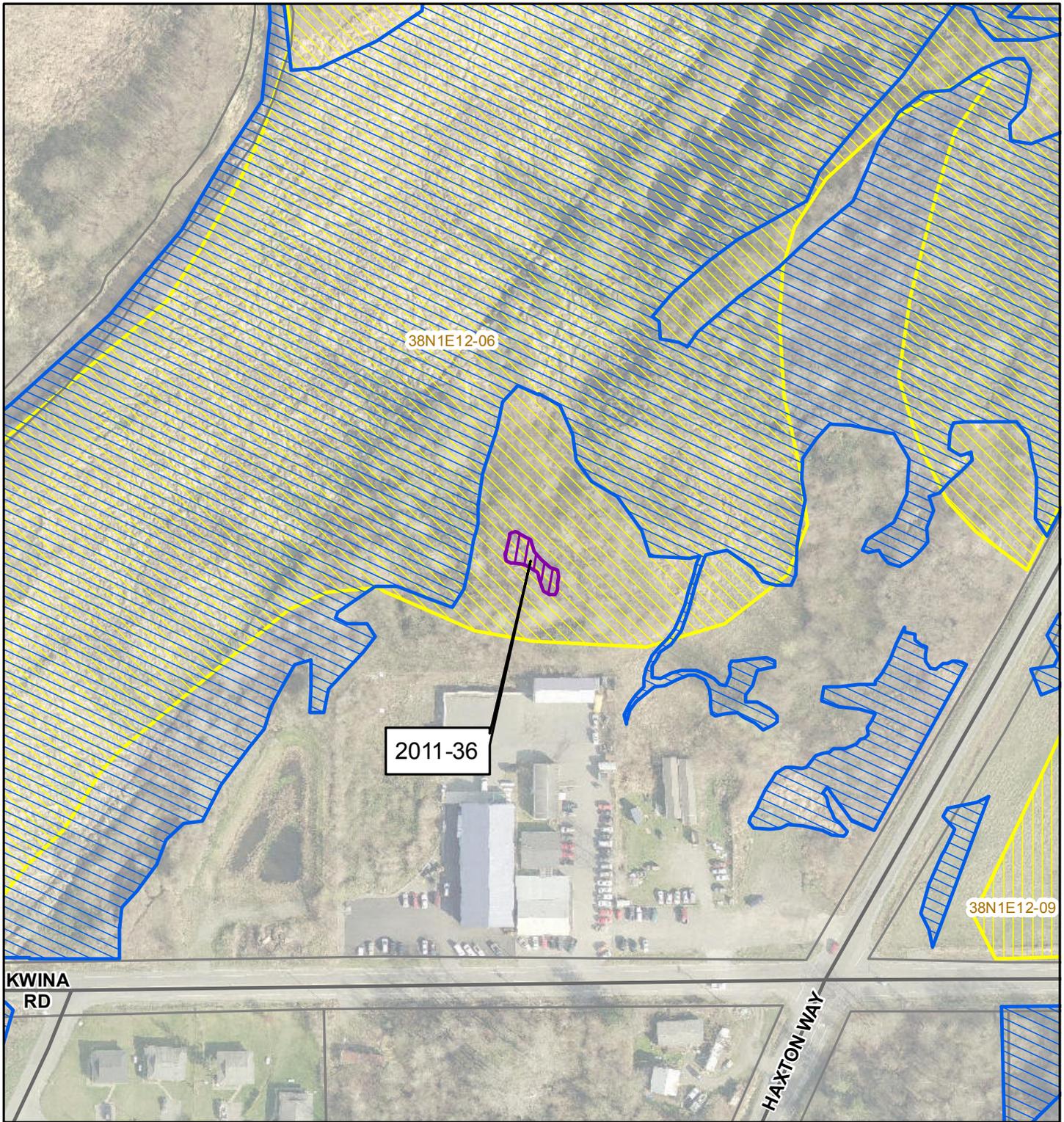
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  -  Parcels
  -  Lummi Reservation
- 0 200 400  
Feet



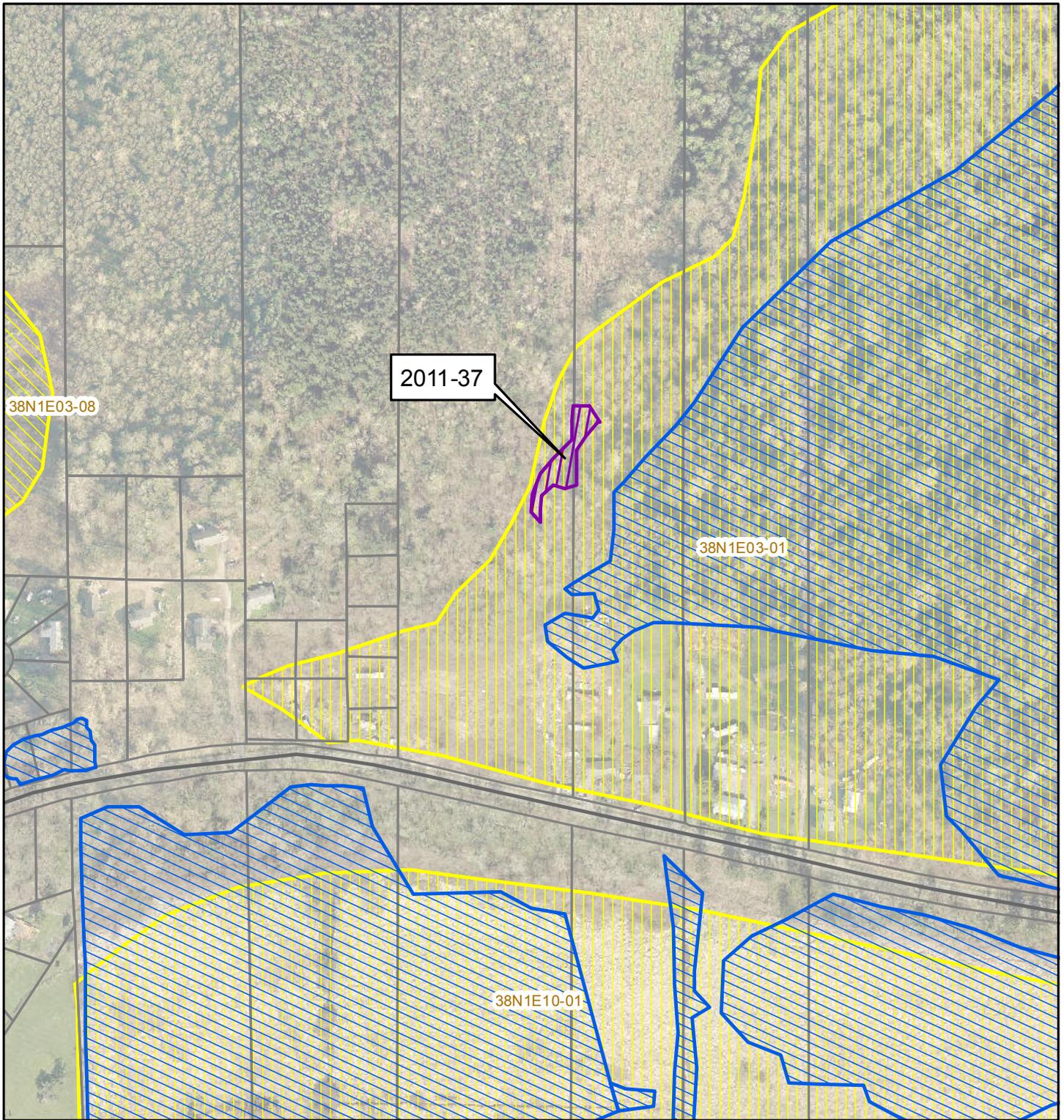
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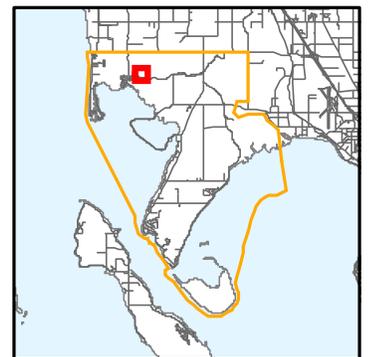
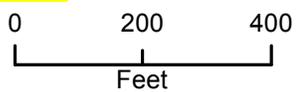
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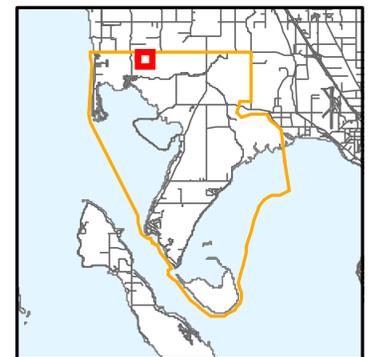
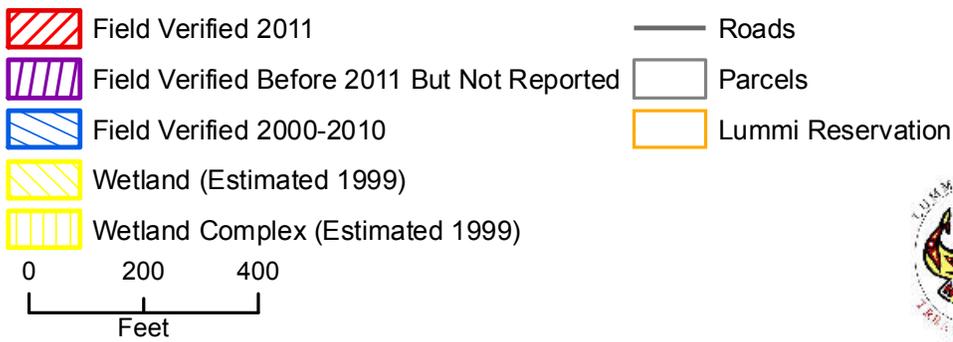
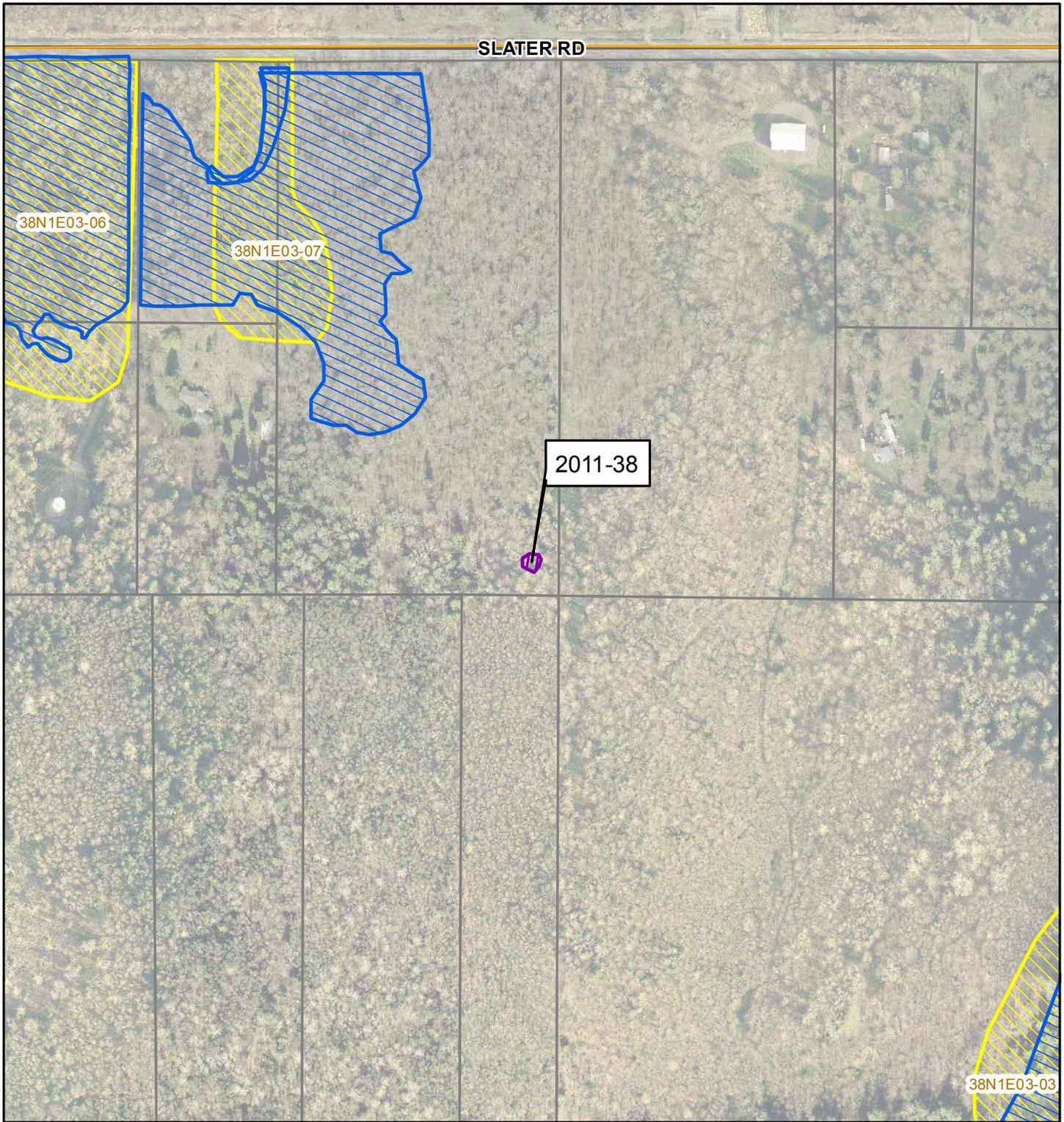
 Roads

 Parcels

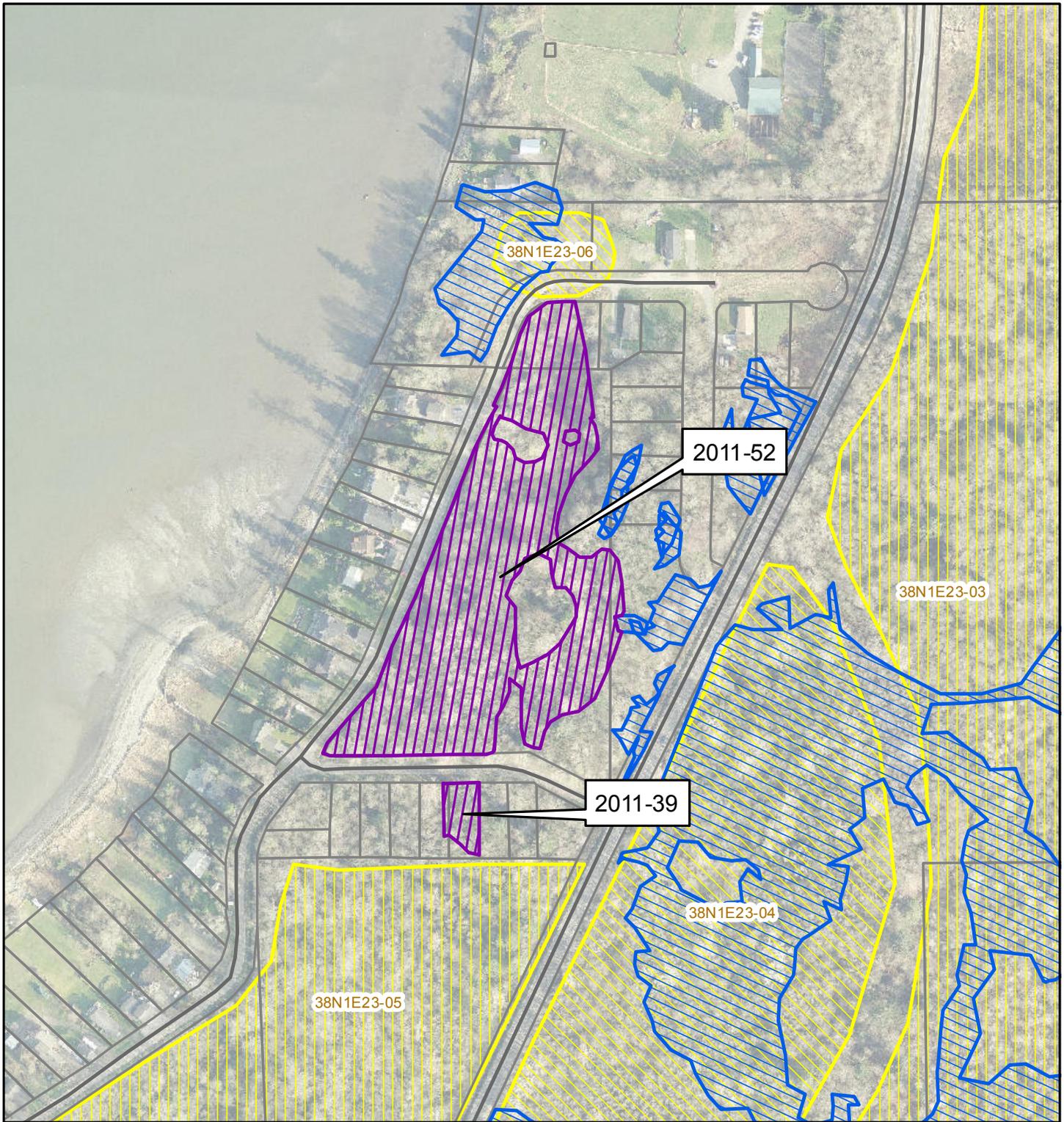
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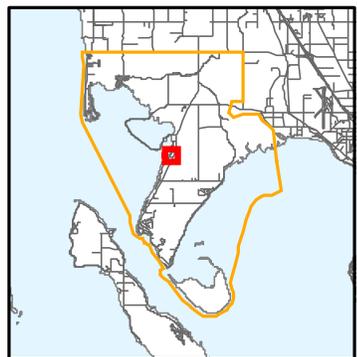
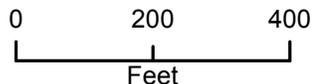


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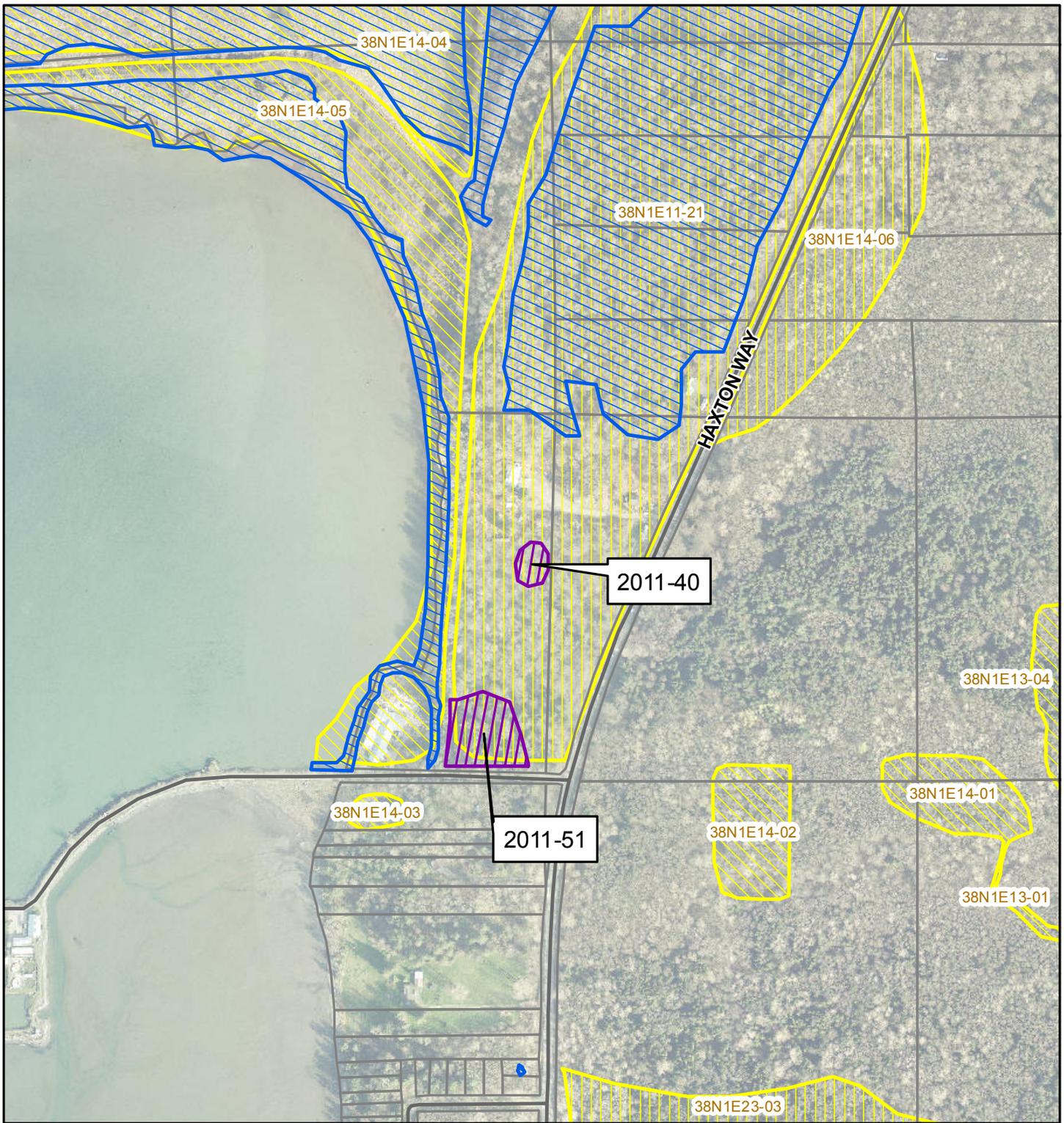


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-  Wetland Complex (Estimated 1999)

-  Roads
-  Parcels
-  Lummi Reservation

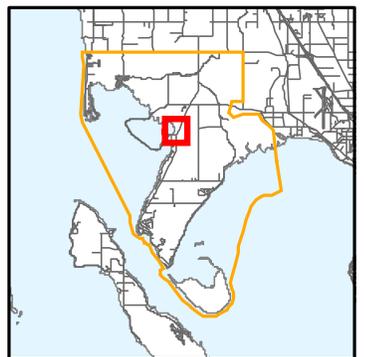
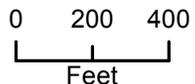


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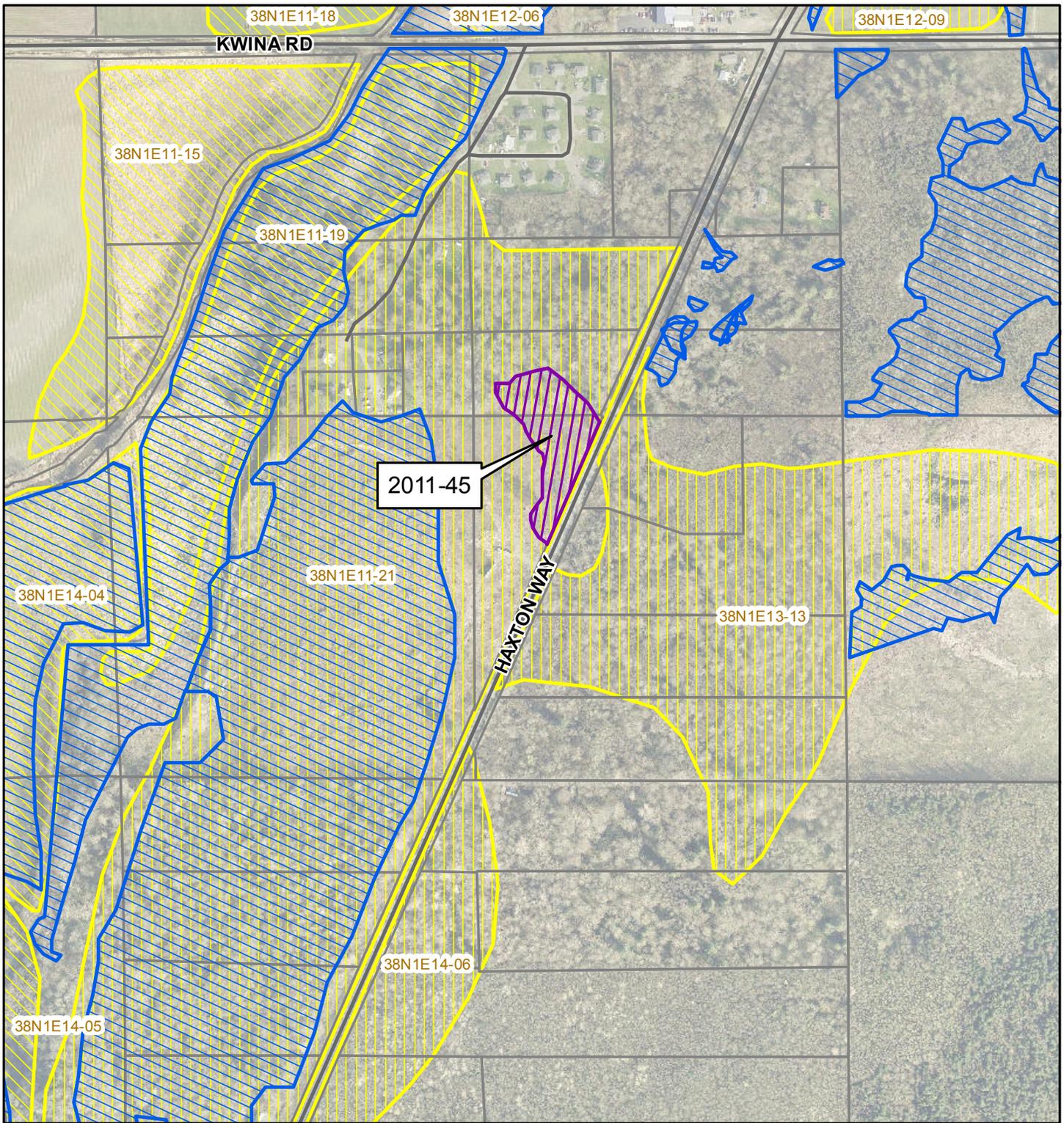


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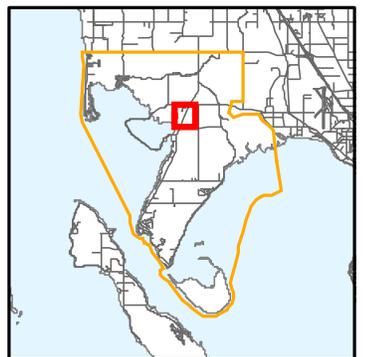
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-  Parcels
-  Lummi Reservation



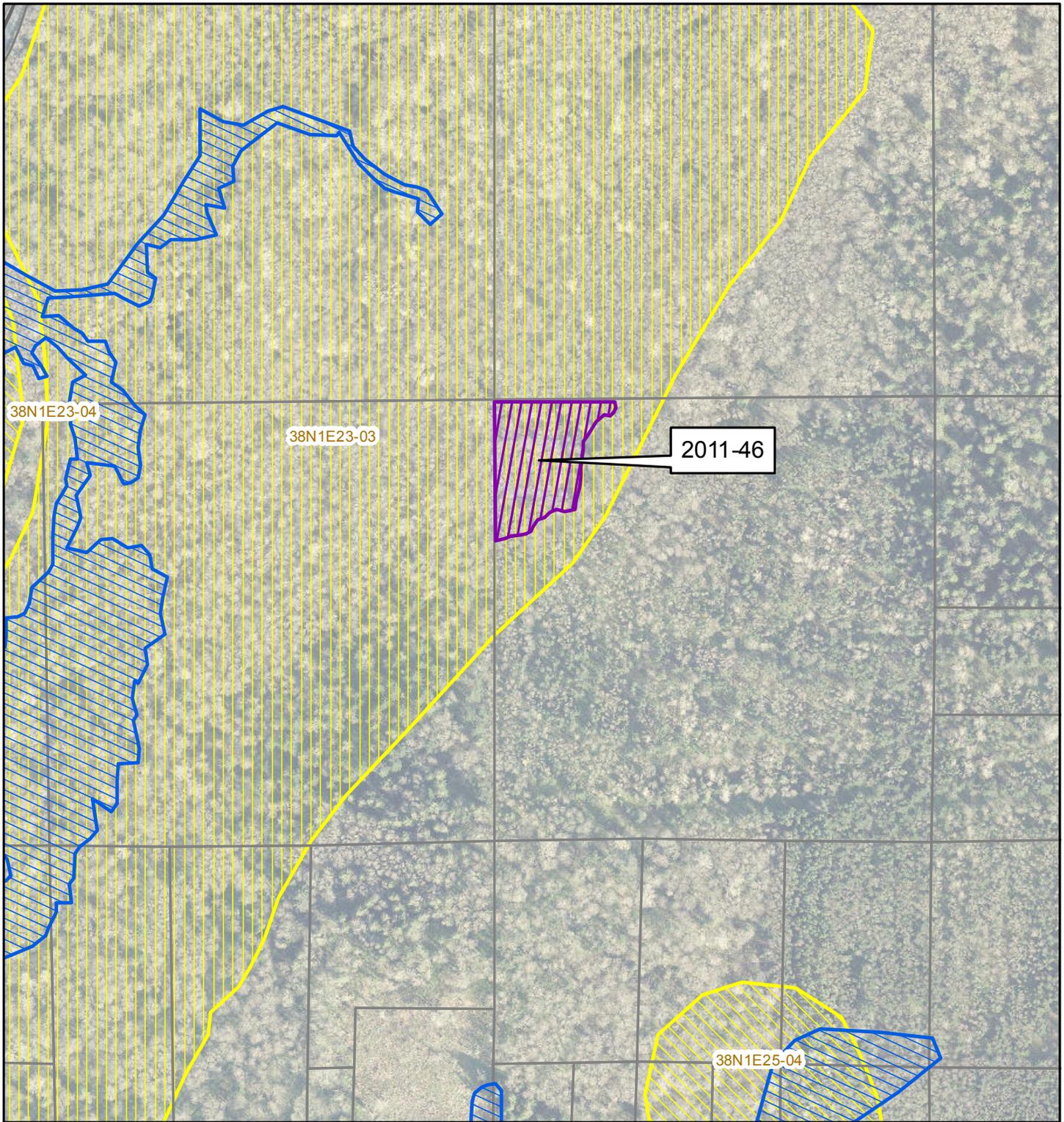
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  -  Parcels
  -  Lummi Reservation
- 0 200 400  
Feet

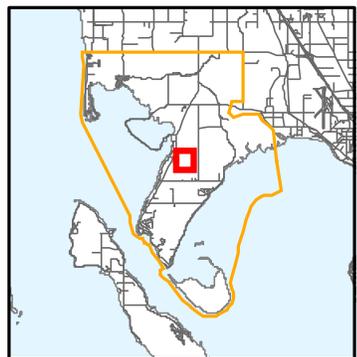
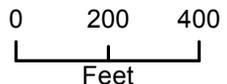


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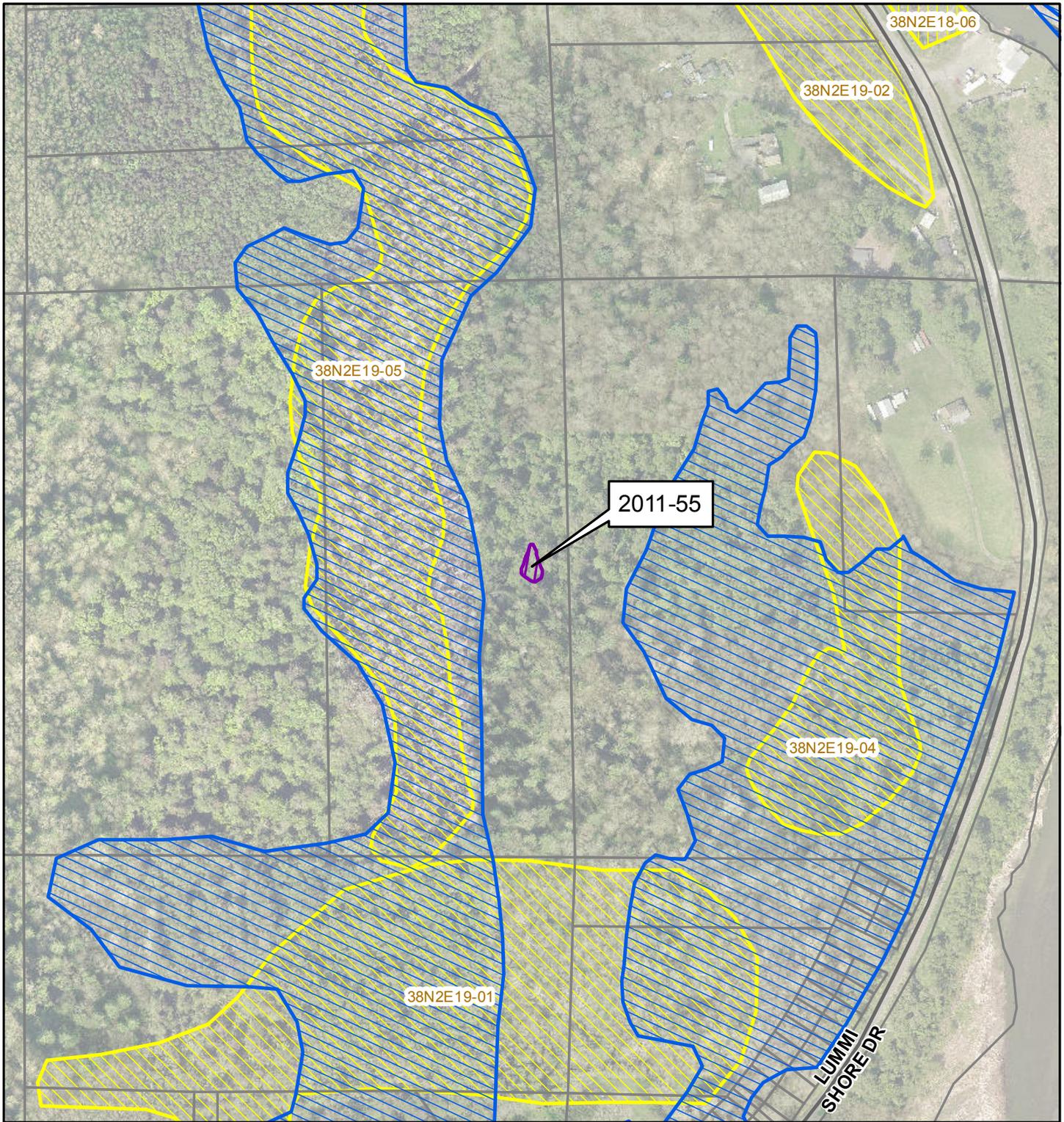


-  Field Verified 2011
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-  Field Verified 2000-2010
-  Wetland (Estimated 1999)
-  Wetland Complex (Estimated 1999)

-  Roads
-  Parcels
-  Lummi Reservation

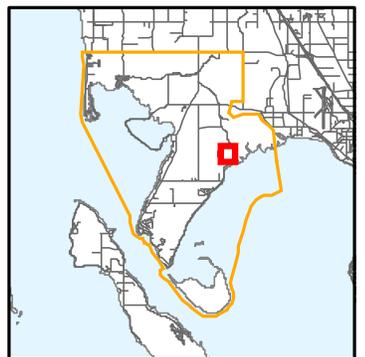
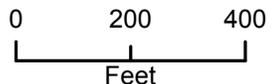


# 2011-55



-  Field Verified 2011
-  Field Verified Before 2011 But Not Reported
-  Field Verified 2000-2010
-  Wetland (Estimated 1999)
-  Wetland Complex (Estimated 1999)

-  Roads
-  Parcels
-  Lummi Reservation



## **APPENDIX B – SAMPLE OF WETLAND RATING WORKSHEETS**

# Classification of Vegetated Wetlands for Western Washington

Wetland name: 2011-07

Date of site visit: 8/11/11

1. Are the water levels in the wetland usually controlled by tides (i.e. except during floods)?

NO = go to question 2. YES = the wetland class is **Tidal Fringe**.

If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt?

YES = **Freshwater Tidal Fringe** NO = **Saltwater Tidal Fringe (Estuarine)**

*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetland.*

*If it is Saltwater Tidal Fringe, it is rated as an Estuarine wetland.*

2. The entire wetland unit is flat and precipitation is the only source (>90%) of water into it.  
Ground water and surface water runoff are NOT sources of water to the unit.

NO = go to question 3. YES = the wetland class is **Flats**

If your wetland can be classified as a Flats wetland,  
use the form for **Depressional** wetlands.

3. Does the entire wetland unit meet **both** of the following criteria?

- The vegetated part of the wetland is on the shores of a body of open water (without any vegetation on the surface) at least 20 acres (8ha) in size;
- At least 30% of the open water area is deeper than 6.6ft (2m)?

NO = go to question 4. YES = the wetland class is **Lake-fringe (Lacustrine Fringe)**

4. Does the entire wetland unit meet **all** of the following criteria?

- The wetland is on a slope (slope can be very gradual).
- The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.
- The water leaves the wetland without being impounded?

*NOTE: Surface water does not pond in these types of wetlands except occasionally in very small and shallow depressions or behind hummocks (depressions are usually <3ft diameter and less than 1 foot deep).*

NO = go to question 5. YES = the wetland class is **Slope**.

5. Does the entire wetland unit **meet all** of the following criteria?

- The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river
- The overbank flooding occurs at least once every two years.

*NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.*

NO = go to question 6. YES = the wetland class is **Riverine**.

6. Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. This means that any outlet, if present, is higher than the interior of the wetland.

NO = go to question 7. YES = the wetland class is **Depressional**.

7. Is the wetland located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by higher groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.

NO = go to question 8. YES = the wetland class is **Depressional**.

8. Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use of the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit; classify the wetland using the class that represents more than 90% of the total area.

HGM Classes within the wetland unit being rated	HGM Class to Use in Rating
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake Fringe	Lake Fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake Fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than two HGM classes within a wetland boundary, classify the wetland as **Depressional** for the rating.

# Wetland Rating Field Data Form- Western Washington

**Background Information:**

Name of Rater: F Lawrence      Affiliation: LNR      Date of site visit: 8/11/11

Name of Wetland (if known): 2011-07

Government Jurisdiction of Wetland: Lummi Nation, EPA, US Army Corps of Engineers

Location (attach map with outline of wetland to rating form):

¼Section:                      Section:                      Township:                      Range:

## SUMMARY OF RATING

Category based on FUNCTIONS provided by wetland:    I     II     III     IV

Category I = Score >70  
 Category II = Score 51-69  
 Category III = Score 30-50  
 Category IV = Score < 30

Score for Water Quality Functions	22
Score for Hydrologic Functions	10
Score for Habitat Functions	14
<b>TOTAL score for Functions</b>	<b>46</b>

Category based on SPECIAL CHARACTERISTICS of wetland

I  II  III  Does not apply

Final Category (choose the "highest" category from above)

III

Check the appropriate type and class of wetland being rated.

**WETLAND TYPE**

**WETLAND CLASS**

Estuarine	<input type="checkbox"/>	Depressional	<input checked="" type="checkbox"/>
Natural Heritage Wetland	<input type="checkbox"/>	Riverine	<input type="checkbox"/>
Bog	<input type="checkbox"/>	Lake-fringe	<input type="checkbox"/>
Mature Forest	<input type="checkbox"/>	Slope	<input type="checkbox"/>
Old Growth Forest	<input type="checkbox"/>	Flats	<input type="checkbox"/>
Coastal Lagoon	<input type="checkbox"/>	Freshwater Tidal	<input type="checkbox"/>
Interdunal	<input type="checkbox"/>		
None of the Above	<input type="checkbox"/>		

**Does the wetland being rated meet any of the criteria below?**

If the answer to any of the questions below is YES than the wetland will need to be protected according to the regulations regarding the special characteristics found in the wetland.

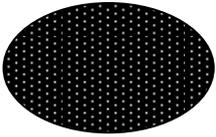
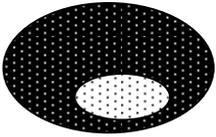
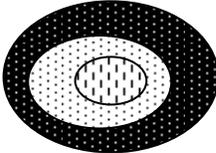
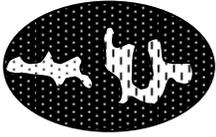
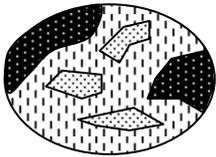
<b>Check List for Wetlands That Need Special Protection, and That Are Not Included in the Rating</b>	<b>YES</b>	<b>NO</b>
<p><b>SP1.</b> <i>Has the wetland been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (T/E species)?</i>                      For the purposes of this rating system, “documented” means the wetland is on the appropriate state or federal database.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><b>SP2.</b> <i>Has the wetland been documented as habitat for any State listed Threatened or Endangered animal species?</i>                      For the purpose of this rating system, “documented” means the wetland is on the appropriate state database.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><b>SP3.</b> <i>Does the wetland contain individuals of Priority species listed by the WDFW for the state?</i></p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<p><b>SP4.</b> <i>Does the wetland have a local significance in addition to its functions?</i>                      For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.</p>	<input type="checkbox"/>	<input checked="" type="checkbox"/>

<b>DEPRESSIONAL AND FLATS WETLANDS</b>		<b>Points</b>
<b>Water Quality Functions –</b> Indicators that wetland functions to improve the water quality.		
<b>D1 Does the wetland unit have the <u>potential</u> to improve water quality?</b>		-----
<b>D1.1</b> Characteristics of surface water which flows out of the wetland: <input type="checkbox"/> Unit is a depression with no surface water leaving it (no outlet) 3 pts <input checked="" type="checkbox"/> Unit has intermittently flowing, or highly constricted permanently flowing outlet 2 pts <input type="checkbox"/> Unit has an un-constricted, or slightly constricted, surface outlet (permanently flowing) 1 pt <input type="checkbox"/> Unit is a flat depression (Q.7), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch 1 pt <i>(If ditch is not permanently flowing, treat unit as intermittently flowing)</i>		2
<b>D1.2</b> The soil two inches below the surface (or duff layer) is clay or organic <i>(use NRCS definitions)</i> <input type="checkbox"/> YES 4 pts <input checked="" type="checkbox"/> NO 0 pts		0
<b>D1.3</b> Characteristics of persistent vegetation (emergent, shrub, and/or forest Cowardin class): <input checked="" type="checkbox"/> Wetland has persistent, ungrazed, vegetation in >95% of the area 5 pts <input type="checkbox"/> Wetland has persistent, ungrazed, vegetation in ≥ ½ of the area 3 pts <input type="checkbox"/> Wetland has persistent, ungrazed, vegetation in ≥ 1/10 of the area 1 pt <input type="checkbox"/> Wetland has persistent, ungrazed, vegetation in < 1/10 of the area 0 pts		5
<b>D1.4</b> Characteristics of seasonal ponding or inundation. <i>This is the area of the wetland unit that is ponded for at least two months, but dries out sometime during the year. Do not count the area that is permanently ponded. Estimate area as the average condition five out of 10 years.</i> <input checked="" type="checkbox"/> Area seasonally ponded is > ½ total area of the wetland 4 pts <input type="checkbox"/> Area seasonally ponded is > ¼ total area of the wetland 2 pts <input type="checkbox"/> Area seasonally ponded is < ¼ total area of the wetland 0 pts		4
<b>Total for D1</b> <i>Add the points in the boxes above</i>		11
<b>D2 Does the wetland unit have the <u>opportunity</u> to improve water quality?</b> Answer YES if you know or believe there are pollutants in groundwater or surface water coming into the wetland that would otherwise reduce quality in streams, lakes, or groundwater down gradient from the wetland. <i>Note which of the following conditions provide the sources of pollutants, A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.</i>  <input type="checkbox"/> Grazing in the wetland or within 150 feet <input checked="" type="checkbox"/> Untreated stormwater discharges to the wetland <input type="checkbox"/> Tilled fields or orchards within 150 feet of the wetland <input type="checkbox"/> A stream or culvert discharges into wetland that drains developed areas, residential areas, farmed fields, roads, or clear-cut logging <input checked="" type="checkbox"/> Residential, urban areas, or golf courses are within 150 feet of wetland <input type="checkbox"/> Wetland is fed by groundwater high in phosphorus or nitrogen <input type="checkbox"/> Other  YES = multiplier is 2                      NO = multiplier is 1		Multiplier 2=
<b>Total- Water Quality Functions</b> Multiply the score from D1 by D2 <i>Add the score to the table on page 1</i>		22

<b>DEPRESSIONAL AND FLATS WETLANDS</b>		<b>Points</b>
<b>Hydrologic Functions</b> Indicators that wetland functions to reduce flooding and stream degradation.		
<b>D3 Does the wetland unit have the <u>potential</u> to reduce flooding and erosion?</b>		-----
<b>D3.1</b> Characteristics of surface water flows out of the wetland unit: <input type="checkbox"/> Unit is a depression with no surface water leaving (no outlet) 4 pts <input checked="" type="checkbox"/> Unit has an intermittently flowing, OR highly constricted permanently flowing outlet 2 pts <input type="checkbox"/> Unit is flat depression (Q.7), or in the Flats class, with permanent surface outflow <b>and no obvious natural outlet</b> and/or outlet is a man-made ditch 1 pt <i>(If ditch is not permanently flowing, treat unit as intermittently flowing)</i> <input type="checkbox"/> Unit has an un-constricted, or slightly constricted, surface outlet ( <i>permanently flowing</i> ) 0 pts		2
<b>D3.2</b> Depth of Storage during wet periods <i>Estimate the height of ponding above the bottom of the outlet. For units with no outlet, measure from the surface of permanent water or deepest part (if dry).</i> <input type="checkbox"/> Marks of ponding are 3 ft or more above the surface or bottom of outlet 7 pts <input type="checkbox"/> The wetland is a headwater wetland 5 pts <input type="checkbox"/> Marks of ponding between 2 ft to < 3 ft from the surface or bottom of outlet 5 pts <input type="checkbox"/> Marks are at least 0.5 ft to < 2 ft from the surface or bottom of outlet 3 pts <input type="checkbox"/> Unit is flat (yes to Q.2 or Q.7) but has small depressions on the surface that trap water 1 pt <input checked="" type="checkbox"/> Marks of ponding less than 0.5 ft 0 pts		0
<b>D3.3</b> Contribution of wetland unit to storage in the watershed <i>Estimate the ratio of: the area of upstream basin contributing surface water to the wetland, to the area of the wetland unit itself.</i> <input type="checkbox"/> The area of the basin is less than 10 times the area of the unit 5 pts <input checked="" type="checkbox"/> The area of the basin is 10 to 100 times the area of the unit 3 pts <input type="checkbox"/> The area of the basin is more than 100 times the area of the unit 0 pt <input type="checkbox"/> Entire unit is in the FLATS class 5 pts		3
<b>Total for D3</b> <i>Add the points in the boxes above</i>		5
<b>D4 Does the wetland unit have the <u>opportunity</u> to reduce flooding and erosion?</b> Answer YES if the wetland is in a location in the watershed where it provides flood storage, or reduction in water velocity; it helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows. Answer NO if the water coming into the wetland is controlled by a structure such as floodgate, tide gate, flap valve, reservoir, etc.; OR you estimate that more than 90% of the water in the wetland is from groundwater in areas where damaging groundwater flooding does not occur. <i>Note which of the following indicators of opportunity apply.</i> <input type="checkbox"/> Wetland is in a headwater of a river or stream that has flooding problems <input type="checkbox"/> Wetland drains to a river or stream that has flooding problems <input type="checkbox"/> Wetland has no outlet and impounds surface runoff water that might otherwise flow into a river or stream that has flooding problems <input checked="" type="checkbox"/> Other In an area with known residential and road flooding problems. <div style="text-align: center;">YES = multiplier is 2      NO = multiplier is 1</div>		Multiplier 2=
<b>Total- Hydrologic Functions</b> Multiply the score from D3 by D4 <i>Add score to table on page 1</i>		10

Comment: D3.2 No defined outlet, overflow to roadside ditch. Active storage likely 0, however, important dead storage up to 12" depth.

<b>HABITAT FUNCTIONS</b> Indicators that the wetland functions to provide important habitat	<b>Points</b>																								
<b>H1 Does the wetland unit have the <u>potential</u> to provide habitat for many species?</b>	-----																								
<p><b>H1.1 Vegetation structure</b>  <i>Check the types of vegetation classes present (as defined in Cowardin) - Size threshold for each class is ¼ acre or more than 10% of the area if unit is smaller than 2.5 acres.</i></p> <p><input type="checkbox"/> Aquatic bed  <input type="checkbox"/> Emergent plants  <input checked="" type="checkbox"/> Scrub/shrub- areas where shrubs have &gt;30% cover  <input checked="" type="checkbox"/> Forested- areas where trees have &gt;30% cover</p> <p><i>If the unit has a forested class, check if:</i>  <input checked="" type="checkbox"/> Forested areas have three out of five strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon</p> <p><i>Add the number of vegetation types that qualify. If you have:</i></p> <table style="width: 100%; border: none;"> <tr> <td style="text-align: right;">4 or more structures</td> <td style="text-align: right;">4 pts</td> </tr> <tr> <td style="text-align: right;">3 structures</td> <td style="text-align: right;">2 pts</td> </tr> <tr> <td style="text-align: right;">2 structures</td> <td style="text-align: right;">1 pt</td> </tr> <tr> <td style="text-align: right;">1 structure</td> <td style="text-align: right;">0 pts</td> </tr> </table>	4 or more structures	4 pts	3 structures	2 pts	2 structures	1 pt	1 structure	0 pts	2																
4 or more structures	4 pts																								
3 structures	2 pts																								
2 structures	1 pt																								
1 structure	0 pts																								
<p><b>H1.2 Hydroperiods</b>  <i>Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or ¼ acre to count.</i></p> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Permanently flooded or inundated</td> <td style="text-align: right;">4 or more present</td> <td style="text-align: right;">3 pts</td> </tr> <tr> <td><input checked="" type="checkbox"/> Seasonally flooded or inundated</td> <td style="text-align: right;">3 present</td> <td style="text-align: right;">2 pts</td> </tr> <tr> <td><input type="checkbox"/> Occasionally flooded or inundated</td> <td style="text-align: right;">2 present</td> <td style="text-align: right;">1 pt</td> </tr> <tr> <td><input checked="" type="checkbox"/> Saturated only</td> <td style="text-align: right;">1 present</td> <td style="text-align: right;">0 pts</td> </tr> <tr> <td><input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland</td> <td></td> <td></td> </tr> <tr> <td><input type="checkbox"/> <b>Lake-fringe wetland</b></td> <td></td> <td style="text-align: right;"><b>2 pts</b></td> </tr> <tr> <td><input type="checkbox"/> <b>Freshwater tidal wetland</b></td> <td></td> <td style="text-align: right;"><b>2 pts</b></td> </tr> </table>	<input type="checkbox"/> Permanently flooded or inundated	4 or more present	3 pts	<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 present	2 pts	<input type="checkbox"/> Occasionally flooded or inundated	2 present	1 pt	<input checked="" type="checkbox"/> Saturated only	1 present	0 pts	<input type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland			<input type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland			<input type="checkbox"/> <b>Lake-fringe wetland</b>		<b>2 pts</b>	<input type="checkbox"/> <b>Freshwater tidal wetland</b>		<b>2 pts</b>	1
<input type="checkbox"/> Permanently flooded or inundated	4 or more present	3 pts																							
<input checked="" type="checkbox"/> Seasonally flooded or inundated	3 present	2 pts																							
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<input type="checkbox"/> <b>Freshwater tidal wetland</b>		<b>2 pts</b>																							
<p><b>H1.3 Richness of Plant Species</b>  Count the number of plant species in the wetland that cover at least 10 square feet. (<i>Different patches of the same species can be combined to meet the size threshold</i>)  <i>You do not have to name the species.</i>  Do not include Eurasian Milfoil, reed canary grass, purple loosestrife, or Canadian thistle</p> <p>Number of Species Counted:</p> <table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> &gt;19 species</td> <td style="text-align: right;">2 pts</td> </tr> <tr> <td><input checked="" type="checkbox"/> 5-19 species</td> <td style="text-align: right;">1 pt</td> </tr> <tr> <td><input type="checkbox"/> &lt;5 species</td> <td style="text-align: right;">0 pts</td> </tr> </table> <p>List of species counted (not required):</p>	<input type="checkbox"/> >19 species	2 pts	<input checked="" type="checkbox"/> 5-19 species	1 pt	<input type="checkbox"/> <5 species	0 pts	1																		
<input type="checkbox"/> >19 species	2 pts																								
<input checked="" type="checkbox"/> 5-19 species	1 pt																								
<input type="checkbox"/> <5 species	0 pts																								

<p><b>H1.4 Interspersion of Habitats</b> Decide from the diagrams below, whether interspersion between Cowardin vegetation classes (described in H1.1), or the classes and un-vegetated areas (can include open water or mudflats) is high, medium, low, or none.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  None = 0         </div> <div style="text-align: center;">  Low = 1         </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  Moderate = 1         </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  High = 3         </div> <div style="text-align: center;">  High = 3         </div> <div style="text-align: center;">  </div> </div> <p>NOTE: If you have four or more classes or three vegetation classes and open water, the rating is always "high".</p>	1
<p><b>H1.5 Special Habitat Features</b> <i>Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the points column.</i></p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (&gt;4 inches diameter and 6ft long)</li> <li><input checked="" type="checkbox"/> Standing snags in the wetland (diameter at bottom &gt;4 inches)</li> <li><input type="checkbox"/> Undercut banks are present for at least 6.6ft (2m) and/or overhanging vegetation which extends at least 3.3ft (1m) over a stream for at least 33 ft (10m)</li> <li><input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (&gt;30degree slope) OR signs of recent beaver activity are present</li> <li><input checked="" type="checkbox"/> At least ¼ acre of thin-stemmed persistent vegetation or woody branches are present in area that are permanently or seasonally inundated (structures for egg-laying by amphibians)</li> <li><input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants</li> </ul>	3
<p><b>H1. Total Score – potential for providing habitat</b> <i>Add the scores in all H1 columns above</i></p>	8

Comments:

H2. Does the wetland unit have the <u>opportunity</u> to provide habitat for many species?	Points
<p><b>H2.1 Buffers</b></p> <p><i>Choose the description that best represents the condition of the buffer of the wetland unit. The highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."</i></p> <p><input type="checkbox"/> 100m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% circumference. No structures are within undisturbed part of buffer. (Relatively undisturbed also means no-grazing, no landscaping, no daily human use.) <b>5 pts</b></p> <p><input type="checkbox"/> 100m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;50% circumference. <b>4 pts</b></p> <p><input type="checkbox"/> 50m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% circumference. <b>4 pts</b></p> <p><input type="checkbox"/> 100m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;25% circumference. <b>3 pts</b></p> <p><input type="checkbox"/> 50m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;50% circumference. <b>3 pts</b></p> <p style="text-align: center;"><b>If the buffer does not meet any of the above criteria</b></p> <p><input type="checkbox"/> No paved areas (except paved trails) or buildings within 25m (80ft) of wetland &gt;95% circumference. Light to moderate grazing, or lawns are OK. <b>2 pts</b></p> <p><input type="checkbox"/> No paved areas or buildings within 50m of wetland for &gt;50% circumference. Light to moderate grazing, or lawns are OK. <b>2 pts</b></p> <p><input type="checkbox"/> Heavy grazing in the buffer. <b>1 pt</b></p> <p><input type="checkbox"/> Vegetated buffers are &lt;2m wide (6.6ft) for more than 95% of the circumference (e.g. tilled fields, paving, basalt bedrock extend to edge of wetland). <b>0 pts</b></p> <p><input checked="" type="checkbox"/> Buffer does not meet any of the criteria above. <b>1 pt</b></p>	1
<p><b>H2.2 Corridors and Connections</b></p> <p><b>H2.2.1</b> Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150ft wide, has at least 30% cover of shrubs, forest, or native undisturbed prairie, that connects to estuaries, other wetlands, or undisturbed uplands that are at least 250 acres in size? Dams in riparian corridors, heavily used gravel roads, and paved roads are considered breaks in the corridor.</p> <p style="text-align: center;">YES = <b>4 points</b> (go to question H 2.3)    NO = go to question H2.2.2</p> <p><b>H2.2.2</b> Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands, or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above.</p> <p style="text-align: center;">YES = <b>2 points</b> (go to question H2.3)    NO = go to question H2.2.3.</p> <p><b>H2.2.3</b> Is the wetland:</p> <p><input checked="" type="checkbox"/> within five miles (8km) of a brackish or salt water estuary OR</p> <p><input type="checkbox"/> within three miles of a large field or pasture (&gt;40 acres) OR</p> <p><input type="checkbox"/> within one mile of a lake greater than 20 acres?</p> <p style="text-align: center;">YES = <b>1 point</b>    NO = <b>0 points</b></p>	1

H2.3 Near or adjacent to other priority habitats listed by WDFW ( <i>updated Oct 2008</i> )	Points
<p>Which of the following priority habitats are within 330ft (100m) of the wetland unit?  <i>NOTE: the connections do not have to be relatively undisturbed.</i></p> <p><input type="checkbox"/> <b>Aspen Stands:</b> Pure or mixed stands of aspen greater than 0.4ha (1 acre).</p> <p><input type="checkbox"/> <b>Biodiversity Areas and Corridors:</b> Areas of habitat that are relatively important to various species of native fish and wildlife. (Full description in WDFW PHS report p. 152).</p> <p><input type="checkbox"/> <b>Herbaceous Balds:</b> Variable size patches of grass and forbs on shallow soils over bedrock.</p> <p><input type="checkbox"/> <b>Old-growth/ Mature Forests:</b> Old growth west of Cascade crest- Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) which are &gt;81 cm (32 in) dbh or &gt; 200 yrs of age. Mature Forests- Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100% ; decay, decadence, numbers of snags, and quality of large downed material is generally less than that found in old-growth; 80-200 yr old west of the Cascade crest.</p> <p><input type="checkbox"/> <b>Oregon White Oak:</b> Woodland stands of pure oak or oak/conifer associations where canopy coverage of the oak component is important (full description in WDFW PHS report p. 158)</p> <p><input type="checkbox"/> <b>Riparian:</b> The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</p> <p><input type="checkbox"/> <b>Westside Prairies:</b> Herbaceous, non-forested plant communities that can either take the form of a dry prairie or wet prairie (full description in WDFW PHS report p. 161).</p> <p><input type="checkbox"/> <b>Instream:</b> The combination of physical, biological, and chemical processes and conditions that interact to provide functional life history requirements for instream fish and wildlife resources.</p> <p><input checked="" type="checkbox"/> <b>Nearshore:</b> Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore (full description in WDFW PHS report p. 167-169, and glossary in Appendix A).</p> <p><input type="checkbox"/> <b>Caves:</b> A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soils, rock, ice or other geological formations and is large enough to contain a human.</p> <p><input type="checkbox"/> <b>Cliffs:</b> Greater than 7.6 m (25ft) high and occurring below 5000ft.</p> <p><input type="checkbox"/> <b>Talus:</b> Homogeneous areas of rock rubble ranging in average size from 0.15 to 2.0 m (0.5 to 6.5ft), composed as basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</p> <p><input type="checkbox"/> <b>Snags and Logs:</b> Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/ use by wildlife. Priority snags have a DBH of &gt;51 cm (20 in) in Western Washington and are &gt;2M (6.5 ft) in height. Priority logs are &gt;30 cm (12 in) in diameter at the largest end and &gt;6 m (20 ft) long.</p>	1
<p>If the wetland has 3 or more priority habitats</p> <p>2 priority habitats</p> <p>1 priority habitat</p> <p>no priority habitats</p>	<p><b>4 pts</b></p> <p><b>3 pts</b></p> <p><b>1 pt</b></p> <p><b>0 pts</b></p>

<p><b>H2.4 Wetland Landscape</b> (<i>see p.85</i>)</p> <p>Choose the one description of the landscape around the wetland that best fits.</p> <p><input type="checkbox"/> There are at least three other wetlands within ½ mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, field, or other development). <b>5 pts</b></p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake with little disturbance and there are three other lake-fringe wetlands within ½ mile. <b>5 pts</b></p> <p><input checked="" type="checkbox"/> There are at least three other wetlands with in ½ mile, BUT the connection between them is disturbed. <b>3 pts</b></p> <p><input type="checkbox"/> The wetland is Lake-fringe on a lake WITH disturbance and there are three other lake-fringe wetlands within ½ mile. <b>3 pts</b></p> <p><input type="checkbox"/> There is at least one other wetland within ½ mile. <b>2 pts</b></p> <p><input type="checkbox"/> There are no other wetlands within ½ mile. <b>0 pts</b></p>	<p><b>Points</b></p> <p>3</p>
<p><b>H2. Total Score - opportunity to provide habitat</b></p> <p><i>Add the scores in all of the H2 columns above</i></p>	<p>6</p>
<p><b>Total for H1</b></p>	<p>8</p>
<p><b>Total Score for Habitat Functions-</b></p> <p><i>Add the points from the total H1 and H2 boxes</i> <i>Add the score to table on page 1</i></p>	<p>14</p>

**WETLAND DETERMINATION DATA FORM – Western Mountain, Valley Coast Region**

Project Site: 2011-07 Lummi Shore Rd and Shorewood Dr.	City/County:	Sample Date: 8/3/11
Applicant/Owner:	State: WA	Sample Point: 1
Investigator: Frank Lawrence, Analiese Burns	Section/Township/Range:	
Landform (hillslope, terrace, etc): Flat	Local Relief (concave, convex, none) : Concave	Subregion: LRR A
Soil Map Unit Name: 93 Labounty Silt Loam	NWI Classification:	
Are climatic/hydrologic conditions on the site typical of this time of year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (if no, explain in Remarks)		
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed? Are "Normal Circumstances" present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic? (If needed, explain any answers in Remarks.)		

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Wetland Hydrology Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Remarks: <b>WETLAND 2011-07</b> Positive indicators for all three parameters were observed at this location.	

**VEGETATION**

Tree Stratum (Plot size: 9 meters )	Absolute % Cover	Indicator Status	Dominant Species?	Dominance Test worksheet	
<i>Populus balsamifera</i>	40	FAC -	<input checked="" type="checkbox"/>	Number of Dominant Species that are OBL, FACW, or FAC:	4
<i>Alnus rubra</i>	60	FAC	<input checked="" type="checkbox"/>		(A)
		-	<input type="checkbox"/>		
		-	<input type="checkbox"/>		
Total Cover:	100			Total number of dominant species across all strata:	5 (AB)
Sapling/Shrub Stratum (Plot size: 3 meters )				Percent of dominant species that are OBL, FACW, FAC:	80
<i>Rosa nutkana</i>	60	FAC -	<input checked="" type="checkbox"/>		(A/AB)
<i>Malus fusca</i>	10	FACW -	<input type="checkbox"/>		
			<input type="checkbox"/>	<b>Prevalence Index worksheet</b>	
		-	<input type="checkbox"/>	OBL species:	x 1=
		-	<input type="checkbox"/>	FACW species:	x 2=
Total Cover:	70			FAC species:	x 3=
Herb Stratum (Plot size: 1 meter )				FACU species:	x 4=
<i>Ranunculus repens</i>	40	FACW -	<input checked="" type="checkbox"/>	UPL species:	x 5=
<i>Agrostis sp.</i>	5	FAC -	<input type="checkbox"/>	Total: (A)	(B)
		-	<input type="checkbox"/>	Prevalence Index = B/A =	
		-	<input type="checkbox"/>	<b>Hydrophytic Vegetation Indicators:</b>	
		-	<input type="checkbox"/>	<input checked="" type="checkbox"/> Dominance Test is > 50%	
		-	<input type="checkbox"/>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>	
		-	<input type="checkbox"/>	<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)	
Total Cover:	45			<input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup>	
Woody Vine Stratum (Plot size: )				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup>	
<i>Rubus armeniacus</i>	10	FACU -	<input checked="" type="checkbox"/>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present.	
		-	<input type="checkbox"/>		
		-	<input type="checkbox"/>		
Total Cover:	10				
% Bare Ground in Herb Stratum: 55					
Remarks: The majority of dominant species observed at this location were hydrophytic.				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

**SOIL**

Sample Point: 1 (wetland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Soil Color		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-9.5	10YR 3/1	94	7.5YR 3/3	5	-	M	Silt Loam	Fine and Prominent
			10YR 5/4	1		M		Fine and Distinct
9.5-20+	10YR 6/2	70	10YR 6/6	20	-	M		Medium and Prominent
			10YR 3/1	5	-	M		
			10YR 4/2	5	-	M		
					-	-		
					-	-		
					-	-		

<sup>1</sup>Type: C=concentration D=depletion RM=reduced matrix <sup>2</sup>Location: PL=pore lining RC=root channel M=matrix

<b>Hydric Soil Indicators: (applicable to all LRRs unless otherwise noted)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input checked="" type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red parent material (TF2) <input type="checkbox"/> Very shallow dark surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present.

<b>Restrictive Layer (if present):</b> Type: Depth (inches):	<b>Hydric Soil Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></b>
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Remarks: Soil observed at this location met NRCS hydric soil indicators.

**HYDROLOGY**

<b>Wetland hydrology Indicators:</b> Primary Indicators (any one indicator is sufficient)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water marks (B1) <input checked="" type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input checked="" type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input checked="" type="checkbox"/> Water-stained Leaves (B9) ( <b>except MLRA 1, 2, 4A and 4B</b> ) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along living roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stresses Plants (D1) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)

<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): (include capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Positive indicators of wetland hydrology were observed at this location. Observation was completed in August.

**WETLAND DETERMINATION DATA FORM – Western Mountain, Valley Coast Region**

Project Site: 2011-07 Lummi Shore Rd and Shorewood Dr.	City/County:	Sample Date: 8/3/11
Applicant/Owner:	State: WA	Sample Point: 2
Investigator: Frank Lawrence, Analiese Burns	Section/Township/Range:	
Landform (hillslope, terrace, etc): Flat	Local Relief (concave, convex, none) : Concave	Subregion: LRR A
Soil Map Unit Name: 93 Labounty Silt Loam	NWI Classification:	
Are climatic/hydrologic conditions on the site typical of this time of year? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> (if no, explain in Remarks)		
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> significantly disturbed? Are "Normal Circumstances" present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>		
Are Vegetation <input type="checkbox"/> , Soil <input type="checkbox"/> , or Hydrology <input type="checkbox"/> naturally problematic? (If needed, explain any answers in Remarks.)		

**SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.**

Hydrophytic Vegetation Present? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Hydric Soil Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Wetland Hydrology Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>Is the Sampled Area within a Wetland?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
Remarks: <b>UPLAND</b> adjacent to wetland 2011-07 Positive indicators for all three parameters were not observed at this location.	

**VEGETATION**

Tree Stratum (Plot size: 9 meters )	Absolute % Cover	Indicator Status	Dominant Species?	Dominance Test worksheet	
<i>Populus balsamifera</i>	30	FAC -	<input checked="" type="checkbox"/>	Number of Dominant Species that are OBL, FACW, or FAC:	3
<i>Alnus rubra</i>	80	FAC	<input checked="" type="checkbox"/>		
<i>Malus fusca</i>	20	FACW	<input type="checkbox"/>		
Total Cover:	130	-	<input type="checkbox"/>	Total number of dominant species across all strata:	5 (AB)
Sapling/Shrub Stratum (Plot size: 3 meters )				Percent of dominant species that or OBL, FACW, FAC:	60  (A/AB)
<i>Symphoricarpos albus</i>	40	FACU -	<input checked="" type="checkbox"/>		
<i>Malus fusca</i>	10	FACW -	<input checked="" type="checkbox"/>		
			<input type="checkbox"/>	<b>Prevalence Index worksheet</b>	
		-	<input type="checkbox"/>	OBL species:	x 1=
		-	<input type="checkbox"/>	FACW species:	x 2=
Total Cover:	50			FAC species:	x 3=
Herb Stratum (Plot size: 1 meter )				FACU species:	x 4=
		-	<input type="checkbox"/>	UPL species:	x 5=
		-	<input type="checkbox"/>	Total:	(A) (B)
		-	<input type="checkbox"/>	Prevalence Index = B/A =	
		-	<input type="checkbox"/>	<b>Hydrophytic Vegetation Indicators:</b>	
		-	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/> Dominance Test is > 50%	
		-	<input type="checkbox"/>	<input type="checkbox"/> Prevalence Index is ≤3.0 <sup>1</sup>	
		-	<input type="checkbox"/>	<input type="checkbox"/> Morphological Adaptations <sup>1</sup> (provide supporting data in Remarks or on a separate sheet)	
Total Cover:	0			<input type="checkbox"/> Wetland Non-Vascular Plants <sup>1</sup>	
Woody Vine Stratum (Plot size: )				<input type="checkbox"/> Problematic Hydrophytic Vegetation <sup>1</sup>	
<i>Rubus armeniacus</i>	50	FACU -	<input checked="" type="checkbox"/>	<sup>1</sup> Indicators of hydric soil and wetland hydrology must be present.	
		-	<input type="checkbox"/>		
		-	<input type="checkbox"/>		
Total Cover:	50				
% Bare Ground in Herb Stratum: 100					
Remarks: The majority of dominant species observed at this location were hydrophytic.				<b>Hydrophytic Vegetation Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

**SOIL**

Sample Point: 2 (upland)

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Soil Color		Redox Features				Texture	Remarks
	Color (moist)	%	Color (moist)	%	Type <sup>1</sup>	Loc <sup>2</sup>		
0-16	10YR 3/1	100			-		Silt Loam	
					-			
					-			
					-	-		
					-	-		
					-	-		

<sup>1</sup>Type: C=concentration D=depletion RM=reduced matrix <sup>2</sup>Location: PL=pore lining RC=root channel M=matrix

<b>Hydric Soil Indicators: (applicable to all LRRs unless otherwise noted)</b> <input type="checkbox"/> Histosol (A1) <input type="checkbox"/> Histic Epipedon (A2) <input type="checkbox"/> Black Histic (A3) <input type="checkbox"/> Hydrogen Sulfide (A4) <input type="checkbox"/> Depleted Below Dark Surface (A11) <input type="checkbox"/> Thick Dark Surface (A12) <input type="checkbox"/> Sandy Mucky Mineral (S1) <input type="checkbox"/> Sandy Gleyed Matrix (S4)		<input type="checkbox"/> Sandy Redox (S5) <input type="checkbox"/> Stripped Matrix (S6) <input type="checkbox"/> Loamy Mucky Mineral (F1) (except MLRA 1) <input type="checkbox"/> Loamy Gleyed Matrix (F2) <input type="checkbox"/> Depleted Matrix (F3) <input type="checkbox"/> Redox Dark Surface (F6) <input type="checkbox"/> Depleted Dark Surface (F7) <input type="checkbox"/> Redox Depressions (F8)	<b>Indicators for Problematic Hydric Soils<sup>3</sup>:</b> <input type="checkbox"/> 2 cm Muck (A10) <input type="checkbox"/> Red parent material (TF2) <input type="checkbox"/> Very shallow dark surface (TF12) <input type="checkbox"/> Other (Explain in Remarks)
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<sup>3</sup>Indicators of hydrophytic vegetation and wetland hydrology must be present.

<b>Restrictive Layer (if present):</b> Type: Depth (inches):	<b>Hydric Soil Present?</b> Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
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Remarks: Soil observed at this location did not meet NRCS hydric soil indicators.

**HYDROLOGY**

<b>Wetland hydrology Indicators:</b> Primary Indicators (any one indicator is sufficient)	Secondary Indicators (2 or more required)
<input type="checkbox"/> Surface Water (A1) <input type="checkbox"/> High Water Table (A2) <input type="checkbox"/> Saturation (A3) <input type="checkbox"/> Water marks (B1) <input type="checkbox"/> Sediment Deposits (B2) <input type="checkbox"/> Drift Deposits (B3) <input type="checkbox"/> Algal Mat or Crust (B4) <input type="checkbox"/> Iron Deposits (B5) <input type="checkbox"/> Surface Soil Cracks (B6) <input type="checkbox"/> Inundation Visible on Aerial Imagery (B7)	<input type="checkbox"/> Sparsely Vegetated Concave Surface (B8) <input type="checkbox"/> Water-stained Leaves (B9) ( <b>except MLRA 1, 2, 4A and 4B</b> ) <input type="checkbox"/> Salt Crust (B11) <input type="checkbox"/> Aquatic Invertebrates (B13) <input type="checkbox"/> Hydrogen Sulfide Odor (C1) <input type="checkbox"/> Oxidized Rhizospheres along living roots (C3) <input type="checkbox"/> Presence of Reduced Iron (C4) <input type="checkbox"/> Recent Iron Reduction in Tilled Soils (C6) <input type="checkbox"/> Stunted or Stresses Plants (D1) ( <b>LRR A</b> ) <input type="checkbox"/> Other (Explain in Remarks)
<input type="checkbox"/> Water-stained (B9) ( <b>MLRA 1,2,4A, and 4B</b> ) <input type="checkbox"/> Drainage Patterns (B10) <input type="checkbox"/> Dry-season Water Table (C2) <input type="checkbox"/> Saturation Visible on Aerial Imagery (C9) <input type="checkbox"/> Geomorphic Position (D2) <input type="checkbox"/> Shallow Aquitard (D3) <input type="checkbox"/> Front-heave Hummocks (D7) <input type="checkbox"/> FAC-neutral (D5)	

<b>Field Observations:</b> Surface Water Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Water Table Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): Saturation Present? Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> Depth (inches): (include capillary fringe)	<b>Wetland Hydrology Present?</b> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
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Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks: Positive indicators of wetland hydrology were not observed at this location. Observation was completed in August. Approximately 1 foot higher than SP1, approximate 1% slope to NW.



Southeast corner of wetland near SP 1.



Central portion of wetland.



Southeast edge of wetland along Lummi Shore Road as seen facing northeast.